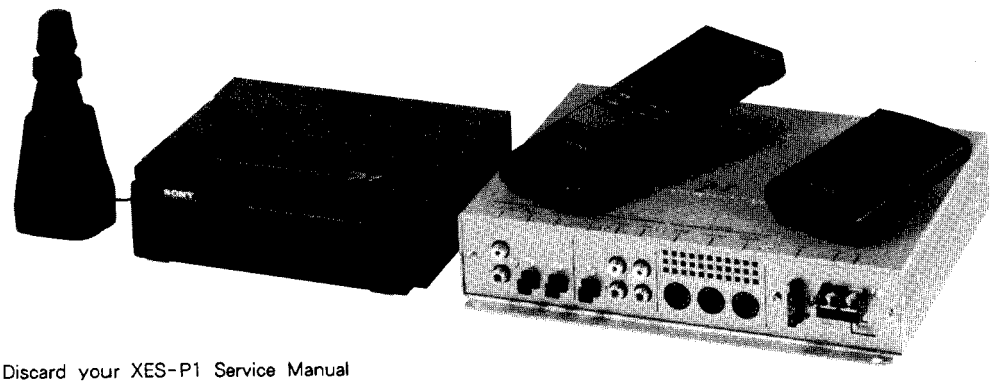
XES-P1

SERVICE MANUAL

US Model

REVISED

Canadian Model
AEP Model
UK Model
E Model



Discard your XES-P1 Service Manual
for US Model (9-956-421-11) previously issued.
This Service Manual contains it.

SPECIFICATIONS

Amplifier section

Frequency response	5 Hz - 20 kHz $^{+0}_{-1}$ dB
(PEQ, SUR and DRS disabled)	
Input sensitivity and input impedance	
	ANALOG INPUT 775 mV, 50 kilohms
	DIGITAL INPUT 1,2
S/N	DIGITAL INPUT 1, 2 front 100 dB, rear 100 dB (A)
Output voltage and output impedance	
	ANALOG OUTPUT +14 dBs 3.8 V (playback of CD, 0dB)
	DIGITAL OUTPUT

Digital Signal Processor section

Parametric Equalizer	
Band	6-band
Center frequency	18 Hz - 20 kHz, 1/9 octave step
Level	±12 dB, 0.1 dB step
Slope (Q)	4-step selectable (0.7, 1.4, 3.7, 20)
Dynamic Range Suppressor	9-step selectable
Surround	
Room Size	0.5 - 2.0
Wall	0.5 - 2.0
Seat Position	F50 - 0 - R50, L50 - 0 - R50
Early Reflection Time	1 - 255 ms
Early Reflection Level	0 - 100%
Reverb Time	0.3 - 5.0 s
Reverb Density	Low, Mid, High
Effect Spread	0.5 - 2.0
Effect Level	0 - 100%
Rear Level	$-\infty$ - 0 dB

A/D, D/A converters section

A/D converter	
Type	High Density Linear Converter
Sampling frequency	44.1 kHz
D/A converter	
Front	18-bit linear 8 fs × 2
Rear	18-bit linear 8 fs × 2

General

Power requirements	12 V DC car batteries (negative ground)
Power consumption	1.5 A
Output	Line outputs for front speakers
	Line outputs for rear speakers
	Optical outputs for front speakers
Input	Line inputs
	Optical input 1
	Optical input 2
	Power input
Dimensions (w/h/d)	
Display unit	178 × 50 × 169 mm (7 1/8 × 2 × 6 3/4 inches) not including projecting parts and controls
Hideaway unit	250 × 50 × 215 mm (9 7/8 × 2 × 8 1/2 inches) not including projecting parts and controls
Mounting dimensions (w/h/d)	
Display unit	178 × 50 × 151 mm (7 1/8 × 2 × 6 inches) not including projecting parts and controls
Hideaway unit	250 × 50 × 215 mm (9 7/8 × 2 × 8 1/2 inches) not including projecting parts and controls
Weight	
Display unit	Approx. 0.9 kg (1 lb. 15 oz)
Hideaway unit	Approx. 1.5 kg (3 lb. 5 oz)
Supplied accessories	Joystick commander (1)
	Mini remote commander (1)
	Full remote commander (1)
	Mounting hardware (1 set)
	Power connection cord (1)
	UNILINK cable 5.5 m (1)
	2 m (1)
	Connection cable (optical) 2 m (1)
	Anti-noise filter XA-50 (1)
	Size AA (R6) batteries (4)

Design and specifications are subject to change without notice.

MICROFILM

DIGITAL CENTRAL PROCESSING UNIT

SONY®

Factory Preset Parameters

Parameter \ Prest No.	1	2	3	4	5	6	7	8	9	10
Suround Mode	HALL 1	HALL 2	OPERA	CHURCH	JAZZ CLUB	DISCO	STADIUM	LIVE CONCERT	THEATER	SMALL HALL
Room Size	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.6
Wall	1.0	1.2	1.1	1.8	1.7	1.0	0.7	1.1	0.7	1.5
Seat Position (Rear-Front, Left-Right)	F2,0	F2,0	F2,0	F2,0	F2,0	0,0	F2,0	F2,0	R5,0	0,0
Effect Level	90%	90%	90%	90%	90%	90%	90%	90%	100%	100%
Early Reflection Time	27ms	32ms	38ms	97ms	21ms	14ms	255ms	68ms	43ms	18ms
Early Reflection Level	80%	80%	80%	65%	—	—	80%	80%	—	—
Reverb Time	2.2sec	2.5sec	1.8sec	2.6sec	—	—	2.0sec	2.4sec	—	—
Spread	1.3	1.6	0.8	2.0	—	—	1.6	1.6	—	—
Reverb Density	Mid	Mid	Mid	Mid	—	—	Mid	Mid	—	—

Features

- Use of Digital Signal Processor (DSP) to freely control the acoustics inside your car (page 48)
- A 6-band Parametric Equalizer (P.EQ) allowing you to finely adjust sound quality (page 56)
- Use of Dynamic Range Suppressor (DRS) to obtain distortion-free sound in a noisy environment for sources with wide dynamic range. (page 84)
- Optical signal transmission avoiding influence from external noise
- An easy-to-read crisp display window (full dot display)
- Custom files for titling discs
- DSP file function for attaching particular soundfield to discs (page 51)
- BANK function to play only desired selections on a compact disc (page 26)
- Last Sound Memory (LSM) function for playing a program source with the stored DSP mode (page 54)
- Able to remotely control optionally available CD changer and digital crossover network

Notes on POWER ON

1. Use approximately 10A for the DC power supply. The set will not operate if the current capacity is too low.
2. Connect XES-C1/XES-T1 to operate as a digital preamplifier. When the optional red power supply cord of the REMOTE terminal is connected to 12V, the set will operate in AUX mode.

Notes on chip component replacement

- Never reuse a disconnected chip component.
- Notice that the minus side of a tantalum capacitor may be damaged by heat.

TABLE OF CONTENTS

Section Title Page

1. GENERAL 3

FUNCTION OF CONTROLS 4

USING YOUR PROCESSING UNIT

CD Changer Operation 7
Various Play Modes 8
Creating Custom Files 12
Radio Operations 14
Receiving a RDS Station 18
Digital Sound Effects for Creating Optimum Acoustics 22
DSP File 23

CONTROLLING SOUNDFIELD

Using Digital Parametric Equalizer 25
Using Digital Surrounds Processor (SUR) 27
Using Dynamic Range Suppressor (DRS) 39
Registering Adjusted DSP 40
Adjusting Crossover Network (CNW) 42
Adjusting Overall Soundfield 50

Joystick Commander 51
Playing the Compact Disc 52
Connections 54

2. DIAGRAMS

2-1. Block Diagrams 57
2-2. Schematic Diagram – Control Section – 59
2-3. Schematic Diagram – Main Section – 63
2-4. Printed Wiring Board – Main/Control Section – 67
2-5. Printed Wiring Board – Display Section – 71
2-6. Schematic Diagram – Display Section – 75
2-7. Circuit Board Location 79
2-8. Semiconductor Lead Layouts 80
2-9. Waveform 81
2-10. IC Block Diagrams 82
2-11. IC Pin Description 88

3. UNILINK 92

4. EXPLODED VIEWS

4-1. Display Unit Section 94
4-2. Hideaway Unit Section 95

5. ELECTRICAL PARTS LIST 96
HARDWARE LIST 105

Precautions

When Using this Equipment for the First Time or When Changing Batteries

- Before you start, push the reset button located on the left side of the display window using the tip of a pencil. (See page 11 on how to remove the front panel.)
- If you make a mistake and an error is displayed, read "Troubleshooting guide" on page 111.

Fuse Replacement

Two fuses are located, one at the rear of the display unit, and the other at the rear of the hideaway unit. When you change the fuse, use only a fuse with the rated capacity (amperes) written on the fuse case. Using fuse with too high amperes, etc. will not only cause failure, but may be very hazardous.

Adjusting Sound Volume

Compact discs use digital recording and so has very little noise, and peaks in music signal are very accurate. If you suddenly turn the volume up too much, you get a very loud sound which may damage the speakers or shock you when you are driving. Thus, always start playing program sources at small volume level.

On the Display Window

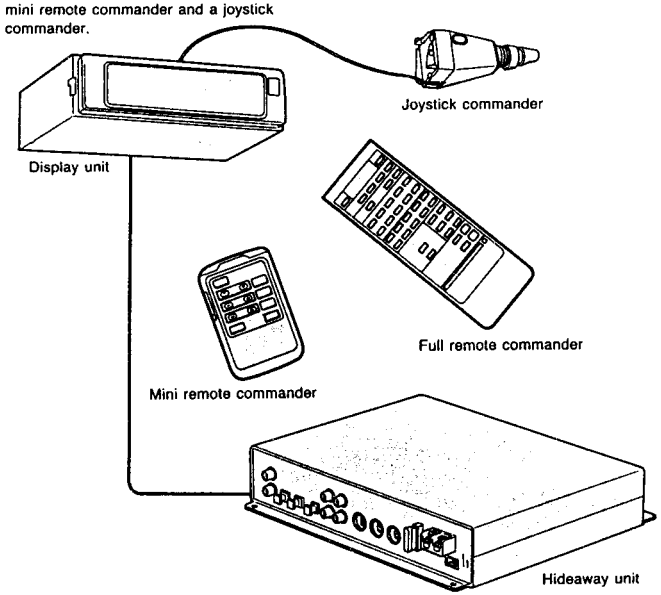
- A cold cathode ray tube is used at the backlight section of the display unit. Under low temperature, the backlight may not turn on due to the characteristic of the cold cathode ray tube. When it becomes warm inside the car, the backlight will turn on.
- Do not press the liquid crystal panel of the display window. Do not place the display unit in a location subject to direct sunlight or ultraviolet rays.
- When you turn on the power, the backlight appears brighter than normal for a few seconds; this process guarantees the backlight will work even under low temperature.

Overview

The XES-P1 is a digital processing preamplifier with a built-in digital signal processor. It comes with remote commanders which you can use to completely control and adjust optionally available CD changer, FM/MW/LW tuner and digital crossover network if they are connected to this equipment.

Configuration

- This equipment consists of a display unit, a hideaway unit, a full remote commander, a mini remote commander and a joystick commander.

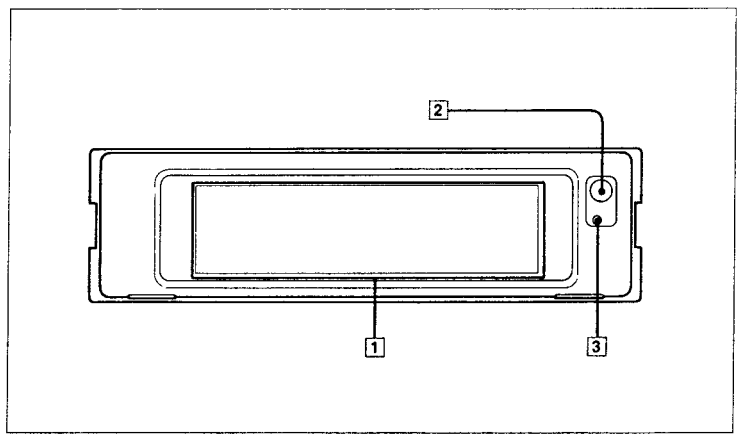


This section is extracted from instruction manual.

Function of Controls

For assembly and connection, refer to the separate "Installation/Connections."

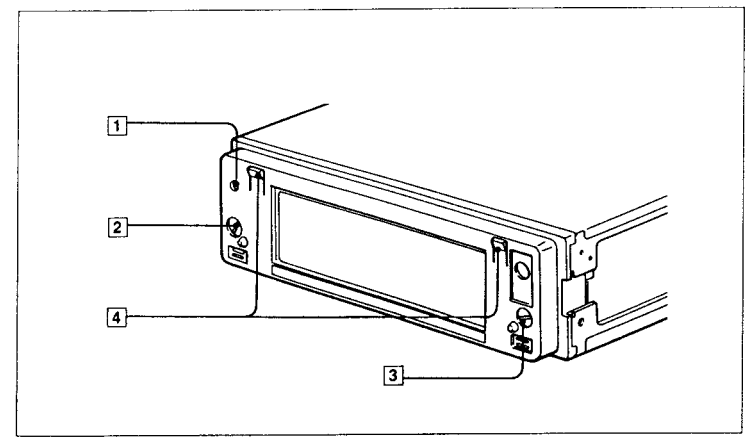
Display Unit



[1] **Display window**

[2] **Remote sensor**

[3] **Auto dimmer sensor**
Automatic dimmer for detecting brightness of the neighboring area and adjusting automatically the backlight brightness. (The backlight may become brighter if being affected by the remote commander operation when neighboring area is dark, but this is not a problem.)



[1] **RESET button**
Press this button if this is the first time you use the equipment or when you replace the car batteries. (See page 6 for details.)

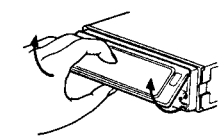
[2] **VIEW (contrast) knob**
Adjusts the contrast of the display window for better reading.

[3] **DIM (dimmer) knob**
Adjusts the brightness of the display window when the neighboring area is dark.

[4] **Panel fixing hooks**

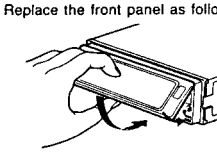
Removing the front panel

Remove the front panel as follows:



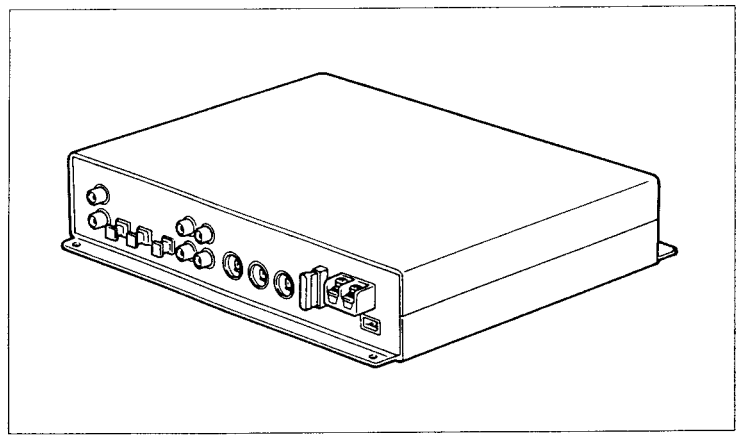
Thumb-catches are located at the left and right sides of the lower part.

Replace the front panel as follows:



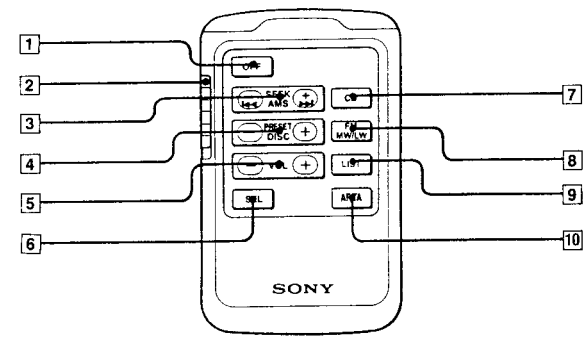
Panel fixing hooks [4] are located at the left and right sides of the upper part.

Hideaway Unit



Mini Remote Commander

This commander lets you operate the basic functions of this equipment.



1 **OFF (power off) button**

2 **M.ILL (memory illumination) switch**
Slide toward you to turn on the buttons' illumination.
This illumination will go off automatically about 15 seconds of after you have released the switch.

3 **SEEK/AMS (seek/automatic music sensor) button**

4 **PRESET/DISC (preset/disc selection) button**

5 **VOL (volume control) button**

6 **SEL (control mode select) button**

7 **CD (CD play/CD changer selection) button**

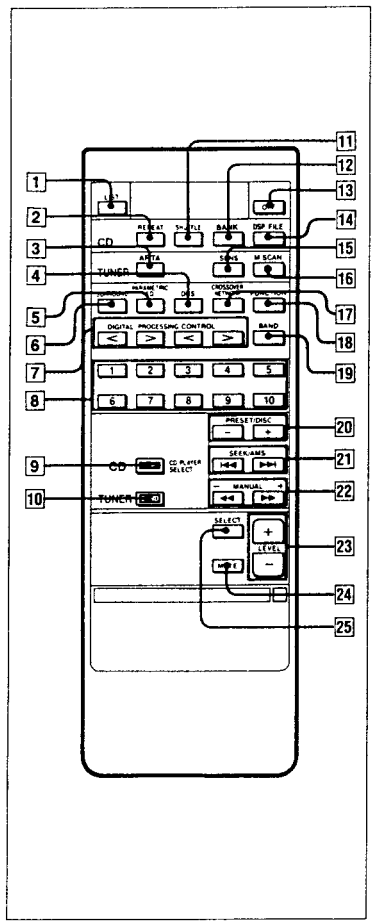
8 **FM/MW/LW (radio/band selection) button**

9 **LIST button**

10 **AF/TA (alternative frequency/traffic information) button**

Full Remote Commander

The full remote commander is used mainly for adjusting various functions.



1 **LIST button**
Same as LIST button on the mini remote commander

2 **REPEAT (repeat play) button**

3 **AF/TA (alternative frequency/traffic information) button**
Use this button for the RDS station reception.

4 **DRS (dynamic range suppressor) button**

5 **PARAMETRIC EQ (parametric equalizer) button**

6 **SURROUND button**

7 **DIGITAL PROCESSING CONTROL buttons**

8 **Numeric buttons**

9 **CD button**
Same as CD button on the mini remote commander

10 **TUNER BAND button**
Same as FM/MW/LW button on the mini remote commander

11 **SHUFFLE (shuffle play) button**

12 **BANK button**

13 **OFF button**
Same as OFF button on the mini remote commander

14 **DSP FILE button**

15 **SENS (radio sensitivity adjustment) button**

16 **M.SCAN (memory scan/best tuning memory) button**

17 **CROSSOVER NETWORK button**

18 **FUNCTION button**

19 **BAND button**

20 **– PRESET/DISC + buttons**
Same as – PRESET/DISC + button on the mini remote commander

21 **⏮ SEEK/AMS ⏭ buttons**
Same as ⏮ SEEK/AMS ⏭ button on the mini remote commander

22 **◀◀ MANUAL ▶▶ buttons**

23 **– LEVEL + buttons**
Same as – VOL + button on the mini remote commander

24 **MUTE button**
Press the button to decrease volume. Press again to resume the volume.

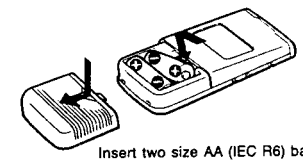
25 **SELECT button**
Same as SEL button on the mini remote commander

Before Using the Remote Commanders

Battery life

Normal operation can be expected for about a half year using Sony SUM-3(NS) batteries. The more frequently you turn on the buttons' illumination (of the Mini remote commander), the shorter the life becomes. When the batteries are exhausted, the remote commander can no longer operate the unit. If this happens, replace both batteries with new ones.

Replacing batteries



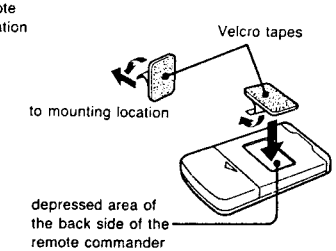
Insert two size AA (IEC R6) batteries with correct polarity.

To avoid damage caused by battery leakage and corrosion

When the commander will not be used for a long time, remove the batteries.

Installing the Remote Commander

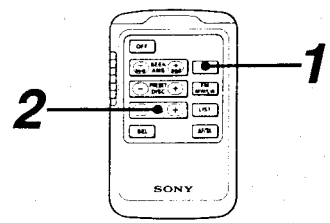
Fasten one of the supplied velcro tapes to the depressed area of the back side of the remote commander, and another to a mounting location in the car.



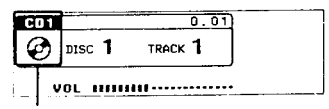
When Mounting the Commander

- Do not install or leave the commander on the dashboard, steering wheel, or any other places under direct sunlight; otherwise, it may become deformed by the heat — especially in the hot summer.
- When you park your car, make sure the commander is away from direct sunlight. Remove the commander and store it, for example, in the glove box.
- Before the installation, choose a location where your commander can function properly. This can be verified by placing the commander at that location to see if it can correctly control the main unit or not.
- Clean the surface of the mounting location before attaching the velcro tape to it.

When an optional CD changer (such as Sony XES-C1) is connected
(See "Installation/Connections" on how to connect the CD changer.)



1 Press CD.
Power is automatically turned on and play starts.

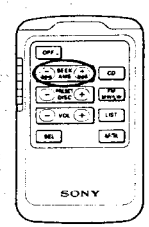


CD play mode is turned on.

2 Press −VOL+ to adjust the sound volume.
- Press + to increase the volume.
- Press − to decrease the volume.

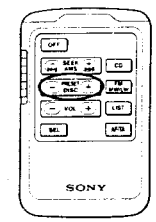
To turn the power off press OFF.

Choosing Selection to Play



- Press ⏮ to go to the beginning of the current selection.
- Keep pressing ⏮ to go to the previous selections.
- Press ⏭ to go to the next selection.
- Keep pressing ⏭ to go to the next selections.

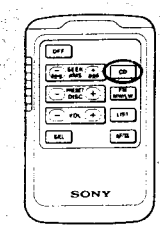
Selecting Disc in the CD Changer



- Press + to go to the next disc.
- Press − to go to the previous disc.

Changing CD Changer

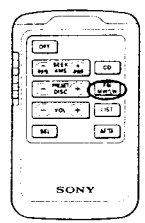
(When two or more CD changers are connected)



- While a disc is being played, press CD.

CD Changer Operation

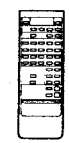
Changing Mode from CD to Radio

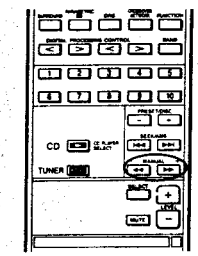


• Press FM/MW/LW to stop CD play and listen to a radio broadcast.

Operation can only be done using the full remote commander.
Various play modes are available for the CD play.

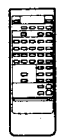
Manual Search

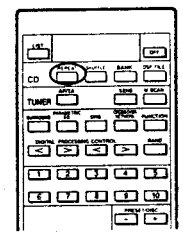




• Press ▶▶ to go ahead at high speed.
• Press ◀◀ to go back at high speed.

Repeat Play





While the CD is being played, pressing REPEAT continuously enables you to select to play the same selection, or the same disc, or the same magazine repeatedly, as indicated in the following cycle.

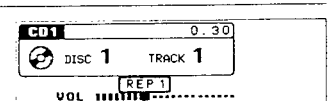
→ REP1 (repeat the same selection) → REP2 (repeat the same disc) → REP3* (repeat the same changer) → OFF (release repeat play) →

* REP3 (repeat the same changer) functions only when two or more CD changers are connected. When only a CD changer is connected, "REP3" will be skipped.

Repeating the current selection (REP1)

• While the CD is being played, press REPEAT to display "REP1".

When the current selection is finished, it will be started over again from the beginning of the selection.

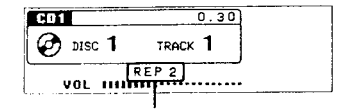


"REP1" is displayed.

Repeating the current disc (REP2)

• While the CD is being played, press REPEAT to display "REP2".

When all selections on the current disc are finished, they will be started all over again from the beginning of the disc.

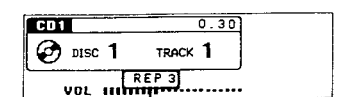


"REP2" is displayed.

Repeating the currently selected changer (REP3-available only when two or more CD changers are connected)

• While the CD is being played, press REPEAT to display "REP3".

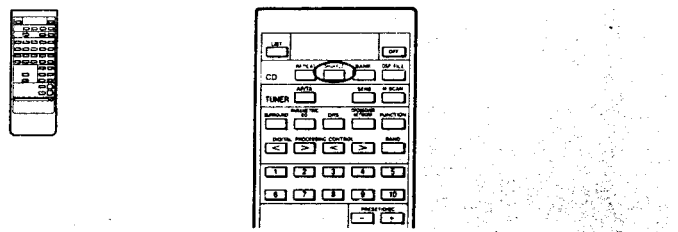
When all selections of all the discs in the current changer are finished, the CD changer will move back to the first disc in the magazine and start all over again.



"REP3" is displayed.

The repeat play is not canceled by turning off the unit. To cancel the repeat play, press REPEAT until it is released (OFF).

Shuffle Play



While the CD is being played, pressing SHUFFLE enables you to randomly play the selections on the disc, the magazine, or the CD changers (if connected two or more), as indicated in the following cycle.

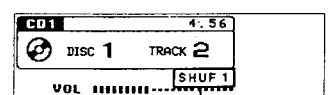
SHUF1 (shuffle selections on a disc) → SHUF2 (shuffle selections in the magazine) → SHUF3* (shuffle selections in all CD changers) → OFF (release shuffle play)

*SHUF3 (shuffle selections in all CD changers) functions only when two or more CD changers are connected. When only a CD changer is connected, "SHUF3" will be skipped.

Playing selections on a disc in random order (SHUF1)

• While the CD is being played, press SHUFFLE to display "SHUF1".

All selections on the current disc will be played at a random order. When they are finished, the next disc will be played.

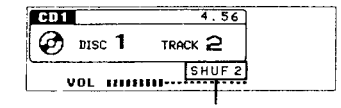


"SHUF1" is displayed.

Playing selections in same magazine in random order (SHUF2)

• While the CD is being played, press SHUFFLE to display "SHUF2".

All selections on all discs in the current magazine will be played at a random order.



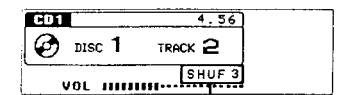
"SHUF2" is displayed.

Playing selections in all CD changers in random order (SHUF3)

(Available only when two or more optional CD changers are connected.)

• While the CD is being played, press SHUFFLE to display "SHUF3".

All selections on all discs in all CD changers will be played at a random order.



"SHUF3" is displayed.

Combining repeat and shuffle play

You can also combine the repeat and shuffle functions.

Repeat disc (REP2) — Shuffle selections on a disc (SHUF1)

Repeat changer (REP3) — Shuffle selections on a disc (SHUF1), Shuffle selections in the magazine (SHUF2)

Press both REPEAT and SHUFFLE to select the desired combination.

The shuffle play is not canceled by turning off the unit or the car battery power. To cancel the shuffle play, press SHUFFLE until "SHUFFLE" disappears.

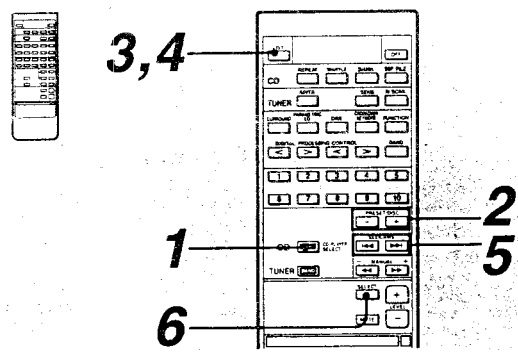
Playing only the Desired Selections (BANK Function)

Operation can only be done using the full remote commander.
The BANK function allows you to select and register only selections you want to hear on a particular disc. The registered information is stored in the memory and not lost even when power is turned off. When this disc is played the next time, only the registered selections will be played.

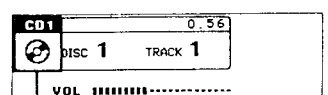
Note: The BANK function is valid only for the CDs registered in the custom file (page 29).

Registering selections

If you want to stop registration halfway, press [LIST] for more than 2 seconds.

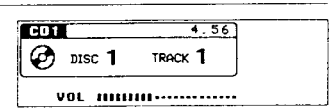


1 **Press [CD].**
Play of a disc starts.



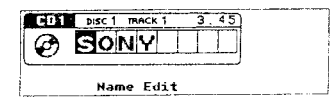
CD play mode is turned on.

2 **Press [– PRESET DISC +] to select disc for BANK registration.**
- **Press [+] for the next disc.**
- **Press [–] for the previous disc.**

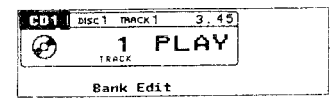


Disc number is displayed.

3 **Press [LIST] for more than 2 seconds.**
The custom file registration mode is turned on.



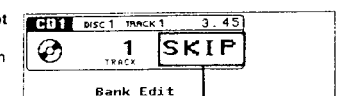
4 **Press [LIST].**
The BANK registration mode is turned on.



5 **Press [⏮ SEEK/AMS ⏭] to choose the selection.**
- **Press [⏭] to move to the next selection.**
- **Press [⏮] to move to the previous selection.**

Selection (track) number is displayed.

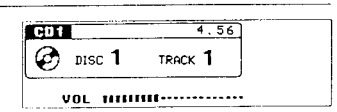
6 **Press [SELECT] to select to play (PLAY) or not to play (SKIP) this selection.**
Pressing [SELECT] continuously toggles between the PLAY and SKIP options.



"PLAY" or "SKIP" is displayed.

7 **Repeat steps 5 and 6 to select other music on the same disc for registration.**

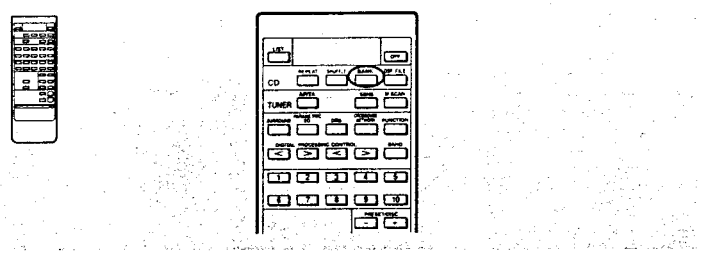
When registration is done, or if you want to stop halfway
- **Press [LIST] for more than 2 seconds.**
CD play mode returns.



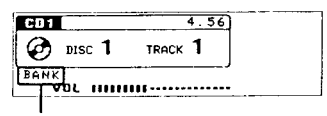
Playing Only the Desired Selections (BANK Function)

BANK function

Operation can only be done using the full remote commander.



• While the CD is being played, press BANK.
Pressing BANK once turns the BANK function on, pressing it again turns the function off.



"BANK" appears while the BANK function is activated.

What Is Custom File?

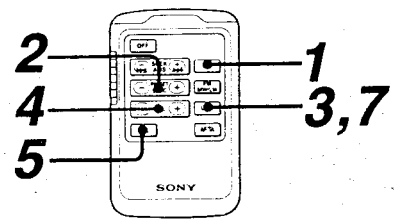
The XES-P1 gives you an option to entitle electronically each disc (for up to 110 discs for a changer connected). You can use the title to describe the disc — e.g. type of music, composer, etc. Then, when the disc is played, the title will appear in the display window to give you more descriptive information about the disc.
A custom file is a collection of all the titles. You can create titles using up to 8 characters or symbols from the below table.

Usable characters and symbols for custom file (45 characters/symbols)

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z 0 1 2 3 4 5 6 7 8 9 + − * / \ > < . (space)

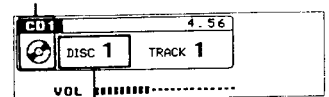
Registering Disc Title

If you want to stop registration halfway, press [LIST] for more than 2 seconds.



1 Press [CD].

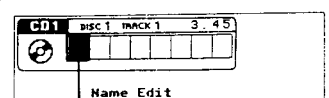
CD play mode is turned on.



Disc number is displayed.

2 Press [-PRESET/DISC+] to select disc for entitling.

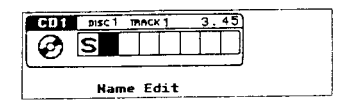
3 Press [LIST] for more than 2 seconds.
Custom file registration mode is turned on.



The cursor appears at the position ready for input.

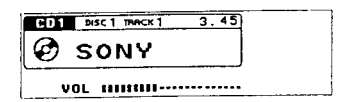
4 Press [-VOL+] to select character or symbol to input as the name of your disc title.
- Press [+] to go to the next character or symbol.
- Press [-] to go to the previous character or symbol.

5 Press [SEL] to input the selected character or symbol.
The cursor moves to the next position for input automatically.



6 Repeat steps 4 to 5 to complete the title.

7 Press [LIST] for more than 2 seconds.
CD play mode returns, and registration is completed.
When you play this disc, the title will be displayed.



To change the disc title

Follow the same procedure as for registering the disc title.

To erase the disc title

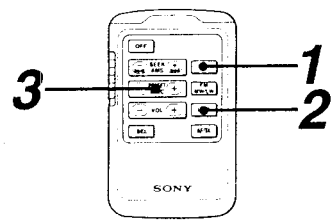
When the memory is full and no more titles can be stored, erase unnecessary titles before registering new ones.

1 Press [LIST] for more than 2 seconds.
Custom file registration mode is turned on.
2 While pressing [SELECT], press [9] (one of the numeric buttons).
"Name Erase Mode" is displayed.
3 Press [-LEVEL+] to select the disc title to be erased.
4 Press [SELECT] for more than 2 seconds.
The selected disc title is erased.
5 While pressing [SELECT], press [9] (one of the numeric buttons).
Custom file registration mode returns.
6 Press [LIST] for more than 2 seconds.
CD play mode returns.

Radio Operations

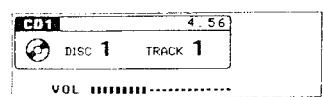
(This applies only if the optionally available tuner, such as XES-T1, is connected. Refer to "Installation/Connection" for how to connect the tuner.)

Playing by a Disc List

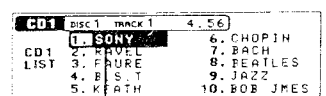


See page 30 on entitling disc.

1 Press CD.
CD play mode is turned on.

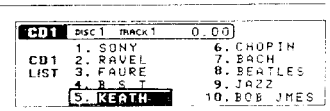


2 Press LIST.
If no CD is set in the magazine, nothing but only numbers are displayed. If a CD with no disc title is set, "******" is displayed at the disc title position.

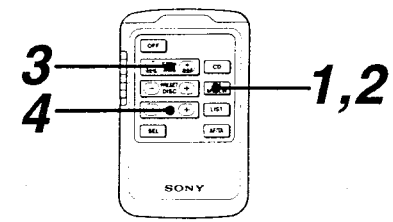


Disc title menu is displayed. The title of the disc being played is reversed.

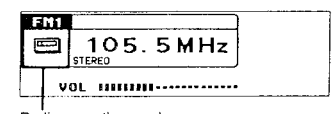
3 Press +PRESET/DISC− to select the entitled disc you want to play. (You can also select directly by pressing the corresponding numeric button on the full remote commander.)
The selected title will be reversed.



Automatic Tuning



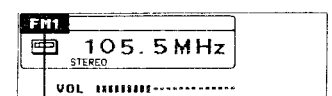
1 Press FM/MW/LW.
Power is turned on and the equipment enters radio reception mode.



Radio reception mode

2 Press FM/MW/LW to select the desired band.
Pressing FM/MW/LW continuously will cycle through

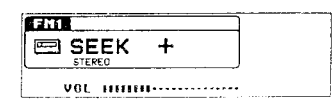
→ FM1 → FM2 → MW → LW →



The selected band is displayed.

3 Press ◄◄ SEEK/AMS ►► to select the desired station.
- Press ►► to move to higher frequency stations.
- Press ◄◄ to move to lower frequency stations.

The XES-P1 automatically seeks the next station that can be received, and stays there until you press the buttons again. Repeat the above steps until you find the station you want. If you press the button while the XES-P1 is seeking, the previously tuned station will be tuned again.

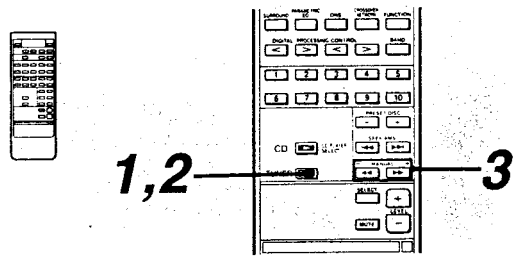


4 Press −VOL+ to adjust sound volume.
- Press + to increase volume.
- Press − to decrease volume.

To turn the power off Press OFF.

Manual Tuning

(Operation can only be done using the full remote commander.)



1 **Press [TUNER BAND].**
Power is turned on and the equipment enters radio reception mode.

2 **Press [TUNER BAND] to select the desired band.**
Pressing [TUNER BAND] continuously will cycle through

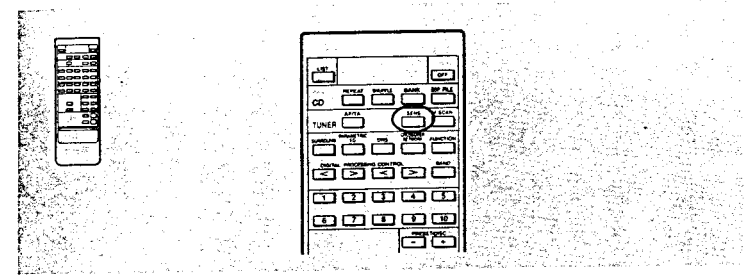
→ FM1 → FM2 → MW → LW →

3 **Press [◄◄ MANUAL ►►] to select the desired station.**
- **Press [►►] to move to higher frequency stations.**
- **Press [◄◄] to move to lower frequency stations.**

To prevent accidents
When you are driving, we recommend you not to use the manual tuning method, but resort to either best tuning memory or automatic tuning method.

Adjusting Reception Mode

(Operation can only be done using the full remote commander.)

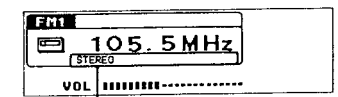


- **While listening to the radio, press [SENS] to select the reception mode.**

Three reception modes are available for selection. Pressing [SENS] continuously cycles through

→STEREO LOCAL → MONO →
└STEREO ←

Choose:
STEREO LOCAL: when there are many stations and you want to cut out those with poor reception
MONO: when FM reception is poor
STEREO: for normal situation



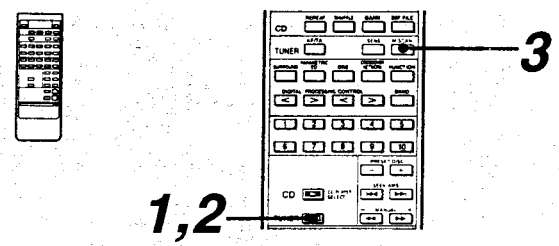
The selected reception level is displayed.

You can register up to a total of 40 stations — 10 stations each for FM1, FM2, MW and LW.

Memory Preset Tuning

Memorizing the stations automatically (BTM: Best Tuning Memory)

(Operation can only be done using the full remote commander.)



1 **Press [TUNER BAND].**
Power is turned on and the equipment enters radio reception mode.

2 **Press [TUNER BAND] again to select the desired band.**
Pressing [TUNER BAND] continuously will cycle through

┌→ FM1 → FM2 → MW → LW ─┐

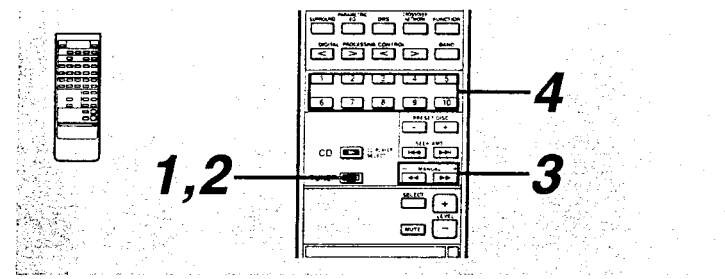
3 **Press [M.SCAN] for more than 2 seconds.**
The XES-P1 automatically starts scanning from the lowest frequency, seeks the station that can be received, and "remembers" it. It then moves on until 10 stations have been registered.

Using BTM
Scanning starts from the lowest frequency in the currently selected band. When the commander finds a station, it will store it to the preset number displayed in the window, or to the next available preset number starting from 1. Even when all the preset numbers are used up, it will continue the scanning, and if it finds a station with reception better than the registered ones, it will replace the registered one with the new one. This process goes on until all of the number contains registered stations with the best reception.

Finally, all the registered stations are recordered and reassigned to the buttons, starting from the one with the lowest frequency — button 1.

Note
If the number of available stations is small or the radio signals are weak, then BTM may end before all buttons are used up.

Memorizing the desired stations manually



1 **Press [TUNER BAND].**
Power is turned on and the equipment enters radio reception mode.

2 **Press [TUNER BAND] again to select the desired band.**
Pressing [TUNER BAND] continuously will cycle through

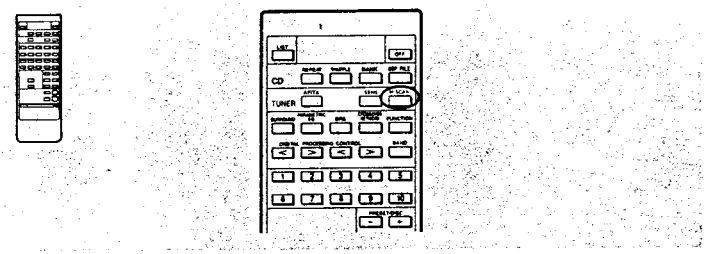
┌→ FM1 → FM2 → MW → LW ─┐

3 **Press [◄◄ MANUAL ►►] button to select the desired station.**
- **Press [►►] to move to higher frequency stations.**
- **Press [◄◄] to move to lower frequency stations.**

4 **Press the numeric button you want to assign the selected station to for more than 2 seconds.**
When a beep tone is heard for the second time, manual assignment is finished. The number of stations you can assign to the 10 numeric buttons is the same as in best tuning memory — that is, 10 stations for each band.

Memory Preset Tuning

Surveying what is being broadcast on the preset stations (memory scan)

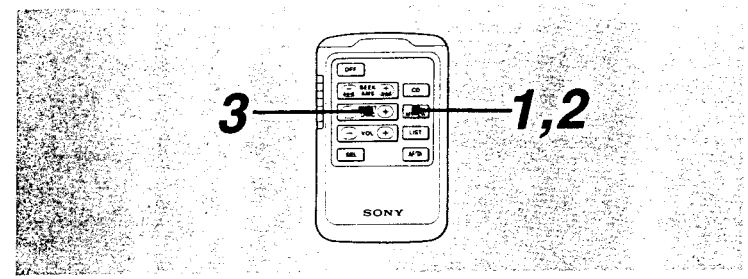


• Press [M.SCAN].
The XES-P1 scans the "remembered" stations. Each "remembered" station is tuned in for 5 seconds. (However, some "remembered" stations may not be received if their radio signal is weak.)

During the memory scan, if you want to force the XES-P1 to stay in the tuned station, press [M.SCAN]. This will release the scan and so the XES-P1 will not move to the next station.

Note
If you keep pressing [M.SCAN] for more than 2 seconds, the station will be memorized.

Receiving a Preset Station



If you have registered stations, you can retrieve them as below. (See pages 36 and 37 on registering stations.)

1 **Press [FM/MW/LW].**
Power is turned on and the equipment enters radio reception mode.

2 **Press [FM/MW/LW] again to select the desired band.**
Pressing [FM/MW/LW] continuously will cycle through

FM1 → FM2 → MW → LW

3 **Press [+PRESET/DISC−] to select the desired station.**
• **Press [+] to go to the next station.**
• **Press [−] to go to the previous station.**

To stop radio reception and start CD play
• **Press [CD].**

Note
When the unit receives a preset station and that station is RDS station, the "•" display comes on to indicate that a RDS station is received.

What is RDS?

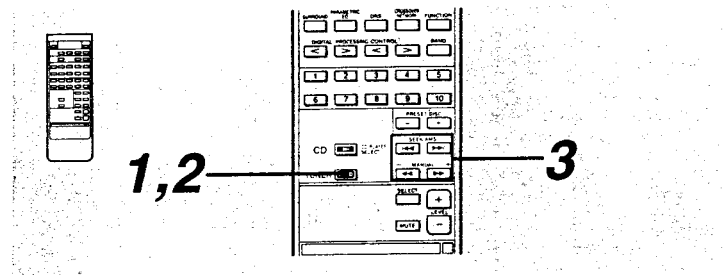
The RDS (Radio Data System) is a radio digital information system developed and introduced in 1987 by the EBU (European Broadcasting Union). Using the 57 kHz sub-carrier of FM broadcasting, the RDS let you receive a variety of information such as station names and traffic information. It also offers useful functions such as automatic re-tuning of the best available signal carrying the chosen program.

The RDS digital data includes the followings:

PI	Program Identification
PS	Program Service Name
AF	List of Alternative Frequencies
TP	Traffic Program
TA	Traffic Announcement
PTY	Program Type

Displaying Station Name

Operation can be done using the mini remote commander also.
This function displays the name of the station which is currently tuned in on the display.



1 **Press [TUNER BAND].**
Power is turned on and the equipment enters radio reception mode.

2 **Press [TUNER BAND] to select the FM1 or FM2.**
Pressing [TUNER BAND] continuously will cycle through

→ FM1 → FM2 → MW → LW →

3 **Tune in a desired station by using the Automatic Tuning or Manual Tuning (page 33 or 34).**
Press [◄◄ MANUAL ►►] or [|◄◄ SEEK/AMS ►►|].

When the unit receives a station transmitting the RDS data, the unit displays the name of that station on the display.

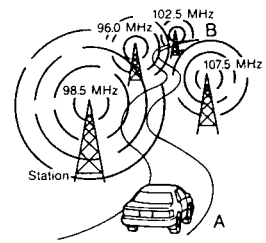
If the unit displays the frequency of the station
The frequency displays change into the name display of the station when the unit receives a RDS station.

When the unit receives a RDS station and that station has already been memorized in the unit
The "*" display comes on the indicate that a RDS station is received.

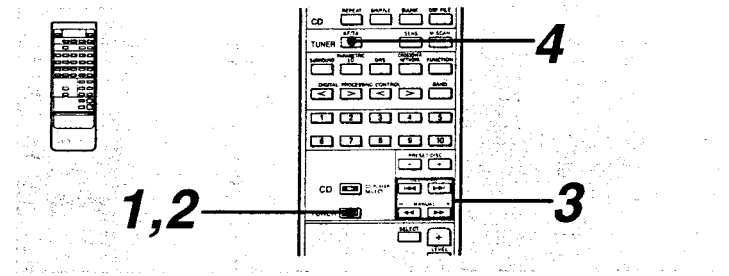
Notes
- RDS data can be received only on the FM band and not on the MW and LW bands.
- The RDS functions of this unit will not be activated if the FM station being received is not transmitting the RDS data. It may also not work properly in an area where the RDS transmissions are in the experimental stage.

Re-tuning in a Station within the Same Broadcasting Network Automatically — AF Function

This function automatically re-tunes in a station with a relatively stronger signal within the same broadcasting network using the PI and AF data. The illustration shows an example of a car passing through an area with four stations of the same broadcasting network between points A and B.
As the car moves on, the reception frequency of the station in the network changes from 98.5 MHz to 107.5 MHz then to 96.0 MHz and to 102.5 MHz.
By using the AF function, the driver will be able to keep listening to a program in the same broadcasting network without tuning in the station manually every time he enters a different frequency zone between points A and B.



Operation can be done using the mini remote commander also.



1 **Press [TUNER BAND].**
Power is turned on and the equipment enters radio reception mode.

2 **Press [TUNER BAND] to select the FM1 or FM2.**
Pressing [TUNER BAND] continuously will cycle through

FM1 → FM2 → MW → LW

3 **Tune in a desired station by using the Automatic Tuning or Manual Tuning (page 33 or 34).**
Press [◄◄ MANUAL ►►] or [⏮ SEEK/AMS ⏭].

4 **Press [AF/TA] to get the "AF" indication.**
If the signal level of the tuned in RDS station falls below a certain point, the unit will begin to search for an alternative station with a stronger signal in the same network from the AF data (List of Alternative Frequencies). If a stronger signal station is found, the unit re-tunes in the station.

Notes
- When the "AF" indication is on the display window, only the RDS station can be tuned in by the Automatic Tuning.
- If the tuned in RDS station is not transmitting the AF data, this function will not work.
- If you press the AF button while the MW or LW band is tuned in, the FM1 band will be automatically selected.

The AF/TA button
Each pressing on the button changes the function cyclically as follws:

Indication

AF → TA* → AF/TA → none

* See page 45 for the TA function.

Re-tuning in a Station within the Same Broadcasting Network Automatically — AF Function (Continued)

Network Stations Memory

When the unit stores the RDS station transmitting the AF data on the preset button, it stores not only its frequency but also its PI and the AF data.The AF data carries the information of the list of the frequencies of the stations within the same broadcasting network. The unit will store the data in its memory whether the AF function is activated or not.

Getting the Stored RDS Stations in Tune from the Broadcasting Networks

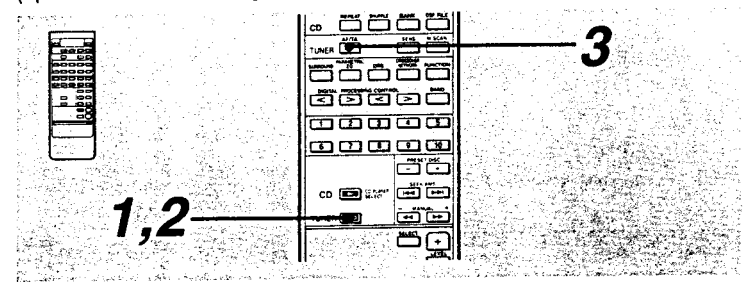
Be sure to press the preset buttons after pressing [AF/TA] to activate the AF function.
The AF function will select a better signal station by re-tuning within the network stations. If you press the preset buttons without activating the AF function, you will not be able to use this function. In this case you will only get the individual stations which were tuned in on the previous occasion. The unit will not re-tune to the other stations in the network without activating the AF function even if they are stored in the memory.

Receiving Traffic Information — TA Function

This function searches and stands by for a traffic information station using the TP and TA data (The SK and DK data will be used in a SDK traffic information station).

Using this function, the unit automatically searches the station and changes its mode to receive the traffic information when the broadcasting starts while you are listening to a CD.

Receiving a Traffic Information Station
(Operation can be done using the mini remote commander also.)



1 **Press [TUNER BAND].**
Power is turned on and the equipment enters radio reception mode.

2 **Press [TUNER BAND] to select the FM1 or FM2.**
Pressing [TUNER BAND] continuously will cycle through
FM1 → FM2 → MW → LW

3 **Press [AF/TA] to get the "TA" indication.**
The search for a traffic information station will start.
When a RDS station transmitting the TP data is found or when a SDK station transmitting the SK data is found, the search stops and the "TP" indication will come on to the display window.
The "TA" indication will flash while the traffic information broadcasting is on the air. It will stop flashing when the broadcasting is over.

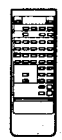
To search for another station transmitting traffic information
Press [◄◄ SEEK/AMS ►►] while the "TA" indication is still on the display window.

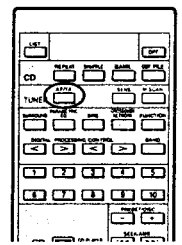
Notes
- Do not activate the TA function in an area where there is no traffic information broadcasting service available. If you do so, the unit will keep searching for it and other stations cannot be tuned in.
- If you activate the TA function while the LW or MW band is tuned in, the FM1 band will be automatically selected and start searching for a traffic information station.

Flashing "TP" indication
This indicates that the currently tuned in RDS station or SDK station offers traffic information service.

Receiving Traffic Information — TA Function (Continued)

Standing by Traffic Information while Listening to a CD
(Operation can be done using the mini remote commander also.)





• Press [AF/TA] to get the "TA" indication during a CD play.

The playback continues while the unit searches for a traffic information station.

When a station is found:
The "TP" indication will flash on the display window.

⇨

When a traffic information broadcasting starts:
The "TA" indication will start flashing and the CD play display (except the symbol for CD) changes into the radio reception display on the unit. The CD play stops and the traffic information will be heard.

⇩

When the broadcasting is over:
The CD play resumes from where it was left off.

To cancel the stand-by mode
Press [AF/TA] to turn off the "TA" indication.

Changing the display to that of the frequency or station name during a CD play
Press [TUNER BAND] for more than 2 seconds, so that the frequency or station name is displayed for 8 seconds. While the frequency or station name is being displayed, the SEEK/AMS, MANUAL buttons and preset buttons will function in the same way as they do in the radio reception.

Note
A traffic information is received only when this unit displays the CD play display or the radio reception display.

Traffic Information is Heard at the Preset Volume Level

When traffic information broadcasting strats, you can hear it at the preset volume level even if the volume control on the front panel has been turned down. (If you are listening to other sources with higher volume level, the level will not change.) The preset volume level can be set in the following manner:
(Operation can only be done using the full remote commander.)

1 **Press [TUNER BAND] to select FM1 or FM2.**
2 **Adjust the volume to the desired level whith [–LEVEL+].**
3 **Press [10] (one of the numeric buttons) while pressing [SELECT].**
A beep sound will be heard and the setting is completed.

PTY (alarm) Data Reception

In case emergency, or in a situation where there may be danger from natural disaster in the area, the RDS stations will transmit the PTY data information to warn drivers that they are in danger. The data includes the character display and the interruption signal for automatically turning on the radio. **This data can be received while the AF or TA function is being activated.** If the unit receives the PTY data from a RDS station during a CD play, the "AF" indication on the display window will start flashing and a CD play stops. The radio will be automatically turned on to receive the emergency announcement from the station.

Digital Sound Effects for Creating Optimum Acoustics

What is Digital Signal Processor (DSP)?

The Digital Signal Processor of this equipment consists of:

- P.EQ (Parametric Equalizer) — for fine adjustment of sound quality
- SUR (Surround Processor) — for creating and adjusting reflected and reverberative sounds
- DRS (Dynamic Range Suppressor) — for adjusting the controllable dynamic range of the program source

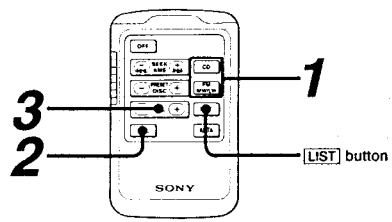
Using these three digital sound effects, you can simulate various acoustic situations in your listening environment.
Because program sources are processed in their original digital form, loss of sound quality is very small and high fidelity can be maintained.

Ten soundfield programs (recommended combinations of each setting) have already been preset in the Digital Sound menu. By choosing, for example, HALL1 effect, you can get the feel of being in a shoe-box type concert hall even though you are actually driving in a car.
You can, of course, create and register your own original soundfield programs by combining and modifying the P.EQ, SUR and DRS parameters.
(See pages 55 to 89 on modifying and registering DSP.)

Digital sound menu

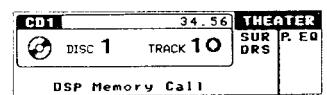
1	HALL1	A shoe-box type concert hall
2	HALL2	A wine yard type concert hall
3	OPERA	An opera house
4	CHURCH	A place, such as church, with a lot of reverberative sound
5	JAZZ CLUB	A jazz club located at the basement
6	DISCO	A disco with thick wall and floor
7	STADIUM	A concert in an open-air stadium
8	LIVE CONCERT	A live concert with over 10,000 audience
9	THEATER	A movie theater
10	SMALL HALL	A small hall for instrumental solo

Adding Digital Sound Effects



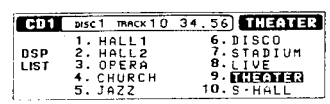
1 Press CD to start CD play, or FM/MW/LW to start radio reception.

2 Press SEL.



The current digital sound menu flashes.

• Press LIST to see the digital sound menu.
Digital Sound menu is displayed.



3 Press −VOL+ to select the desired digital sound menu.
• Press + to move to the next program.
• Press − to move to the previous program.
While the Digital Sound menu is displayed, you can also press the corresponding numeric button on the full remote commander for direct selection.

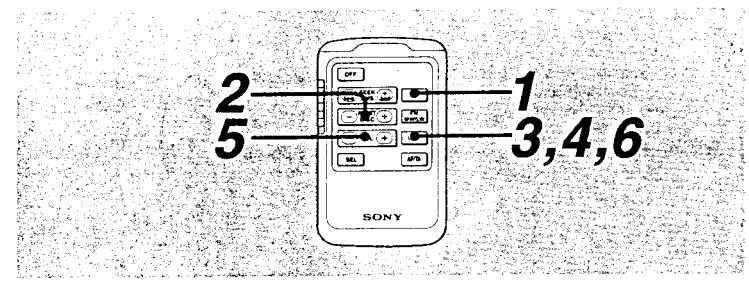
To return to the play mode
Press LIST.
If you do not want to add digital sound effects
Press SURROUND, PARAMETRIC EQ and DRS.
Each press turns on and off the SUR, P.EQ and DRS respectively.

What Is DSP File?

You can select from the digital sound menu the type of digital sound effect you like to add to a particular disc, and store this information to a custom file. This process is called DSP File. Then, whenever you load this disc, it will be played with the registered digital sound effect.

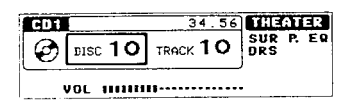
Note
The DSP File function is valid only for the discs to which disc titles are registered.

Registering DSP File

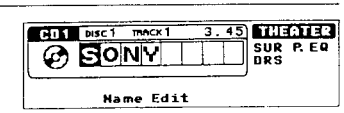


1 Press CD to start play of a CD.

2 Press −PRESET/DISC+ to select the disc.



3 Press LIST for more than 2 seconds.
The custom file registration mode is turned on.

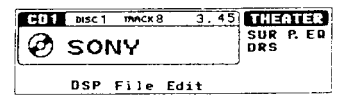


to be continued ⇨

Registering DSP File

Continued

4 **Press [LIST] twice.**
The DSP file registration mode is turned on.

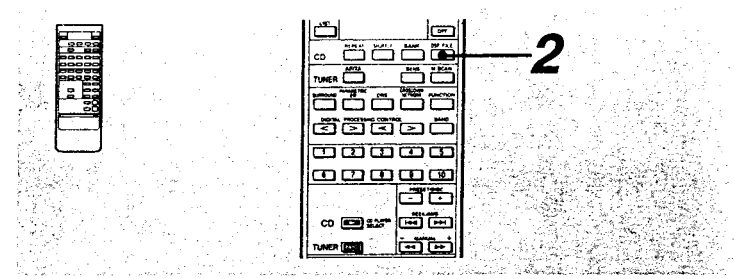


5 **Press [– VOL +] to select the desired item.**

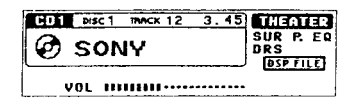
6 **Press [LIST] for more than 2 seconds.**
When a beep tone is heard for the second time, the sound effect is attached to the current disc and the information is stored to the custom file, and the play mode returns.

Playing with DSP File

Operation can only be done using the full remote commander.



1 **Register the DSP file.**
See page 51 on how to register the DSP file.



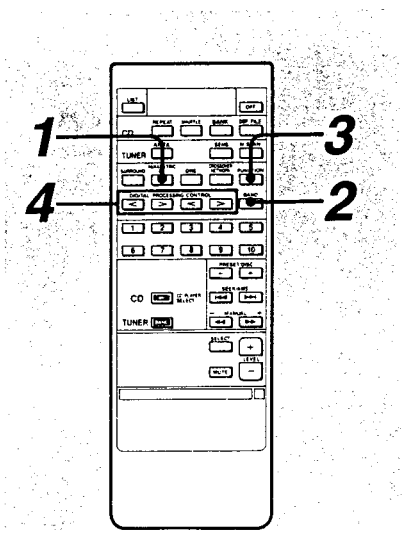
2 **Press [DSP FILE].**
The DSP file mode is turned on.

To disable DSP file mode
• **Press [DSP FILE].**
The DSP FILE indicator goes off, and the XES-P1 returns to the normal play mode.

What Is P.EQ?

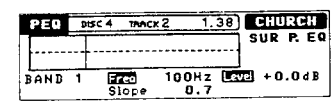
- P.EQ is a tone control system with adjustable level, center frequency and slope (Q). The XES-P1 provides flexible equalization using a 6-band parametric equalizer with independent control of level, center frequency, and slope.
- When listening in the car, you can use P.EQ parameters to mask the unpleasant sound effect and add your original soundfield effects to turn your car into your favorite type of audio room.
- When you select the digital sound menu to be adjusted and turn on the P.EQ adjustment mode (see next page), "P.EQ" is displayed. Replay the program source (CD or radio) and adjust the P.EQ while listening to the program source. This allows you to obtain the best sound effect. We recommend you to immediately register the adjusted parameters. See page 86 on registration.

Adjusting P.EQ

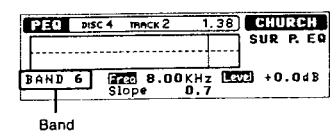


To cancel adjustment during operation, press [PARAMETRIC EQ] for more than 2 seconds.

1 **Press [PARAMETRIC EQ] for more than 2 seconds.**
The P.EQ adjustment mode is turned on.

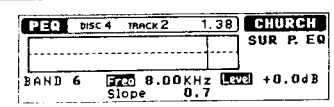


2 **Press [BAND] to select band to be adjusted.**
There are a total of 6 bands. Pressing [BAND] continuously will change the band from BAND1 to BAND6.

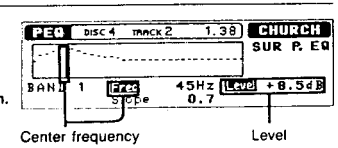


3 **Press [FUNCTION] and select Freq and Level.**
Pressing [FUNCTION] will alternate between the following two selections:

Freq, Level↔Slope, Level

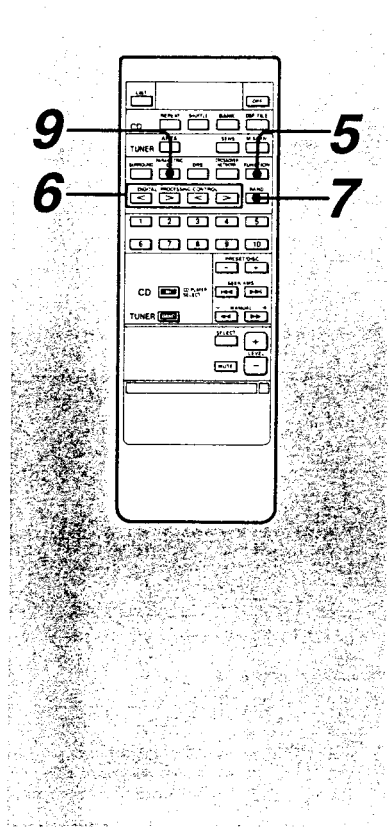


4 **Press [DIGITAL PROCESSING CONTROL] to select center frequency and adjust the level.**
- **Press [<][>][<][>] ↑ to shift center frequency up.**
- **Press [<][>][<][>] ↑ to shift center frequency down.**
- **Press [<][>][<][>] ↑ to increase level of center frequency.**
- **Press [<][>][<][>] ↑ to decrease level of center frequency.**



to be continued ⇨

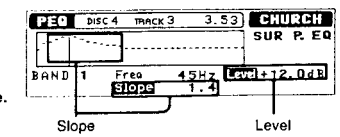
Adjusting P.EQ



Continued

5 **Press [FUNCTION].**
The slope adjustment mode is turned on.
Pressing [FUNCTION] continuously will cycle through
Slope adjustment mode → center frequency selection mode

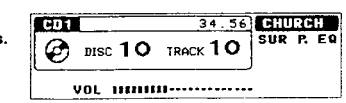
6 **Press [DIGITAL PROCESSING CONTROL] to adjust slope.**
- **Press [<] [>] [<] [>] to decrease the angle of slope.**
- **Press [<] [>] [<] [>] to increase the angle of slope.**
- **Press [<] [>] [<] [>] to decrease the center frequency level.**
- **Press [<] [>] [<] [>] to increase the center frequency level.**



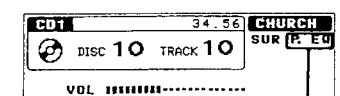
7 **When there are still other frequency bands to be adjusted**
Press [BAND].

8 **Repeat steps 3 to 7 until desired equalization curve is obtained.**

9 **When P.EQ adjustment is finished**
Press [PARAMETRIC EQ] for more than 2 seconds.
XES-P1 returns to CD play mode.



To see if P.EQ is in effect
Press [PARAMETRIC EQ].
When the effect is on, P.EQ appears in the display window. When the effect is off, P.EQ goes off. Listen to the play sound with and without the P.EQ effect to check how the P.EQ modifies the sound.



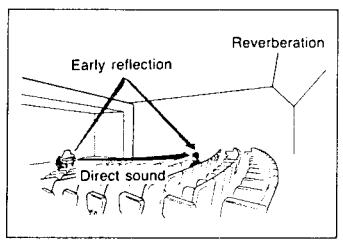
P.EQ is displayed when the P.EQ is in effect.

What Is SUR?

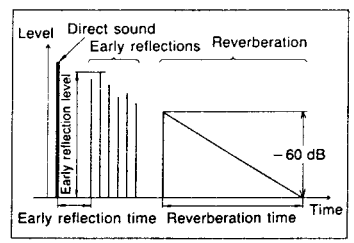
The sound you hear in a place such as a concert hall or a movie theater consists of direct sound, early reflections and reverberation. The acoustics of the room affect the way these three sounds are heard. We can estimate the size or the type of a hall by listening to and differentiating these three kinds of sound.

The XES-P1 reproduces the early reflections and the reverberation using its digital signal processor and allows you to design a variety of soundfields in a car.
The unit incorporates 10 types of surround modes, and within each mode, you can adjust several parameters to maximize the effect in your listening environment.

Types of the sound



Transition of the sound



Adjustable parameters list

REVERB Time, Dens	Simulation of reverberation time and density
E.REF Time, Lvl	Simulation of early reflection time and level
S.POS F-R, L-R	Simulation of listening position
ROOM Size, Wall	Simulation of room size and wall material
EFFECT Sprd, Lvl	Simulation of spread and level of reflected sound and reverberation
REAR Lvl	Simulation of reflection from the rear

Adjusting SUR Parameters

- Select the digital sound menu to be adjusted, and press [SURROUND] for more than 2 seconds. The SUR adjustment mode is turned on.
  Press [FUNCTION] to select the parameter to be adjusted.
  (The selected parameter is reversed in the display window.)
  Pressing [FUNCTION] continuously will cycle through

  ┌→ REVERB → E.REF → S.POS → ROOM
  └→ EFFECT → REAR ┘

- When you turn on the SUR adjustment mode, "SUR" is displayed. Replay the program source (CD or radio) and adjust the SUR while listening to the program source. This allows you to obtain the best sound effect.
- We recommend you to immediately register the adjusted parameters. See page 86 on registration.
- When [SURROUND] is pressed, no signal is output from the rear of the XES-P1.
- When you listen to a source such as news or dramas, we recommend you select JAZZ mode or THEATER mode and adjust the parameters as follows;

  E.REF: 1ms
  S.POS: R50
  ROOM: 0.5
  WALL: 0.5

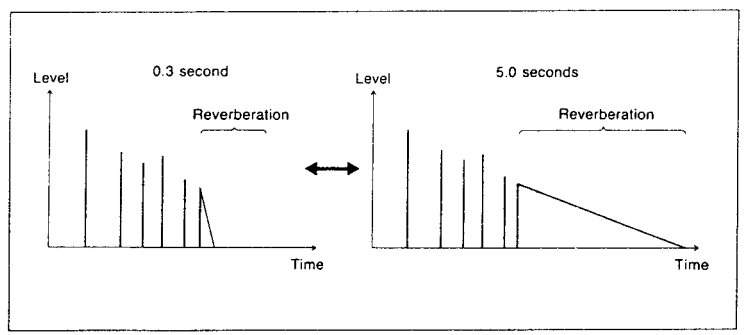
  You can hear clear sound with little reverberation from the four speakers if you make these adjustments.
  When you listen to using only two speakers, set SUR to "OFF" or set EFFECT Lvl to "0".

Adjusting SUR Parameters

Reverb Time

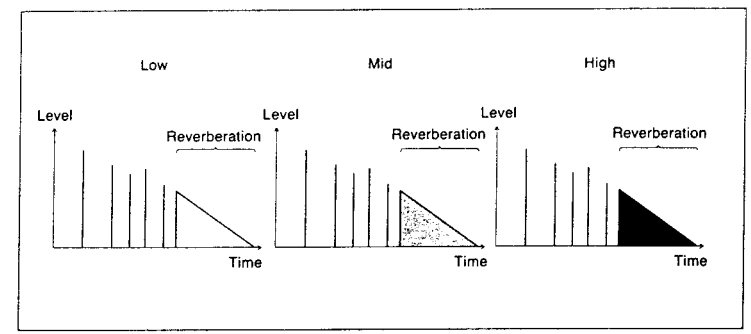
This parameter adjusts the length of the reverberation — the time required for reverberative sound to decrease to −60 dB. The adjustable range is from 0.3 to 5.0 seconds.

(This parameter cannot be adjusted with the digital sound menu JAZZ CLUB, DISCO, THEATER, and SMALL HALL.)



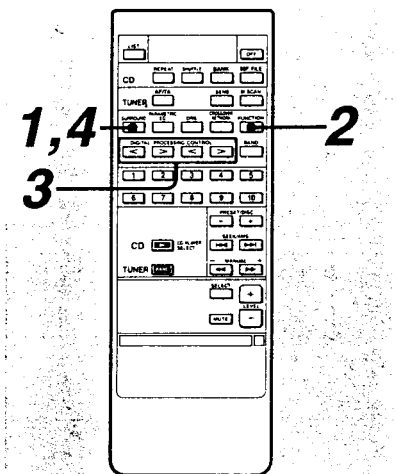
Reverb Density

The reverberation density parameter adjusts the density (number of responses) of the reverberation to obtain natural reverberation for various program sources. Usually, set this parameter to Mid (middle). When the program source itself is very reverberative, like a live recording, set it to Low; set it to High when the program source is not reverberative.
(This parameter cannot be adjusted with the digital sound menu JAZZ CLUB, DISCO, THEATER, and SMALL HALL.)



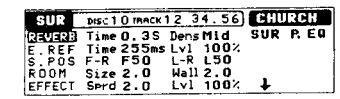
Adjusting SUR Parameters

Adjusting reverb time and reverb density

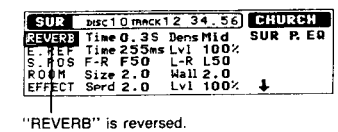


If you want to cancel the adjustment halfway, press [SURROUND] for more than 2 seconds.

1 Press [SURROUND] for more than 2 seconds.
SUR adjustment mode is turned on.


SUR
Disc 1 0 Track 1 2 34.56
CHURCH
REVERB Time 0.3S Dens Mid
SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

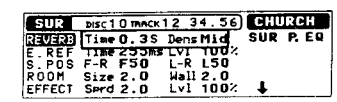
2 Press [FUNCTION] to select REVERB.


SUR
Disc 1 0 Track 1 2 34.56
CHURCH
REVERB Time 0.3S Dens Mid
SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

"REVERB" is reversed.

3 Press [DIGITAL PROCESSING CONTROL] to adjust each parameter.

- Press [<] [>] [<] [>] to decrease reverb time.
- Press [<] [>] [<] [>] to increase reverb time.
- Press [<] [>] [<] [>] to decrease reverb density.
- Press [<] [>] [<] [>] to increase reverb density.

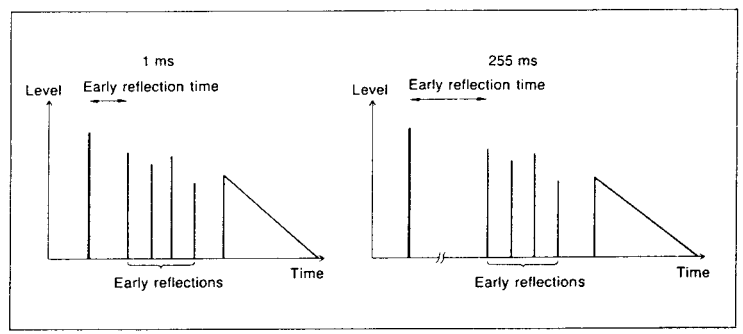

SUR
Disc 1 0 Track 1 2 34.56
CHURCH
REVERB Time 0.3S Dens Mid
SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

4 When adjustment is finished
Press [SURROUND] for more than 2 seconds.
The XES-P1 returns to the play mode.

Adjusting SUR Parameters

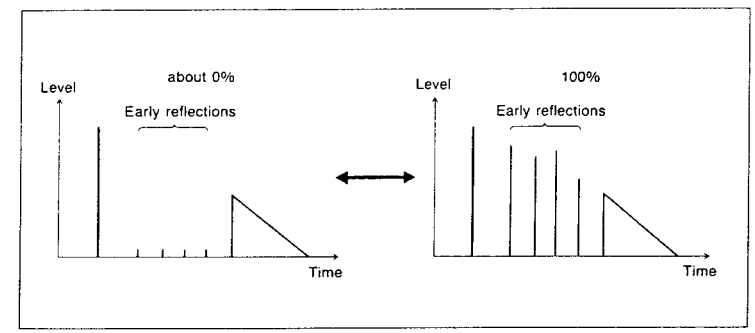
Early Reflection time

The early reflection time is the key parameter which simulates the room size and listening position. Adjustment of this parameter will vary the time required for the sound to reach the listening position. The adjustable range is from 1ms to 255ms, and the longer the time, the longer you will feel the distance to the origin of the sound.



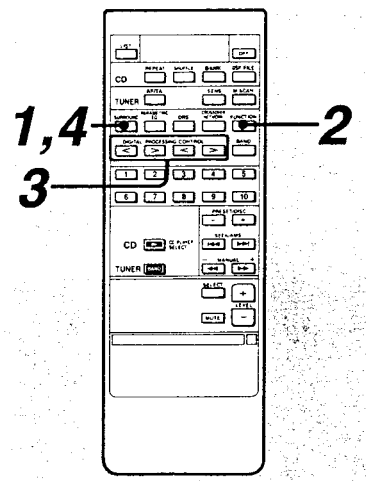
Early Reflection level

The early reflection level simulates the acoustic liveness of the listening room. The adjustable range is from 0 to 100%; the higher the percentage, the better liveness you can feel. When it is small, you will feel the room "dead". (This parameter cannot be adjusted with the digital sound menu JAZZ CLUB, DISCO, THEATER, and SMALL HALL.)



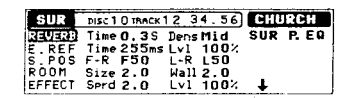
Adjusting SUR Parameters

Adjusting early reflection time and level

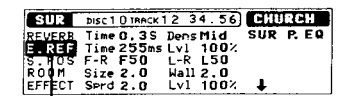


If you want to cancel the operation halfway, press [SURROUND] for more than 2 seconds.

1 Press [SURROUND] for more than 2 seconds.
SUR adjustment mode is turned on.

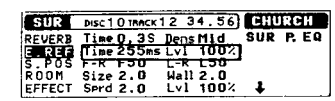

SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

2 Press [FUNCTION] once to select E.REF.


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

"E.REF" is reversed.

3 Press [DIGITAL PROCESSING CONTROL] to adjust each parameter.
- Press [<][>][<][>] ↑ to decrease early reflection time.
- Press [<][>][<][>] ↑ to increase early reflection time.
- Press [<][>][<][>] ↑ to decrease early reflection level.
- Press [<][>][<][>] ↑ to increase early reflection level.

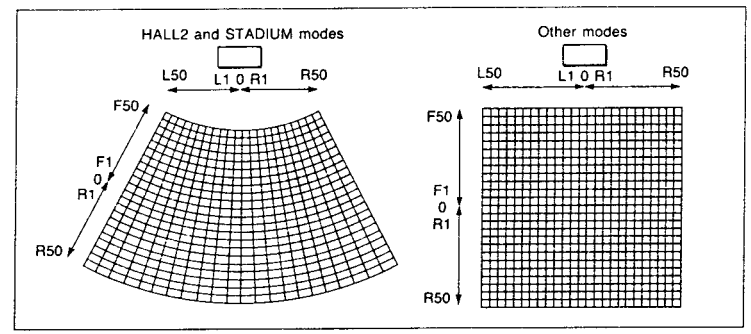

SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

4 When adjustment is finished
Press [SURROUND] for more than 2 seconds.
The XES-P1 returns to the play mode.

Adjusting SUR Parameters

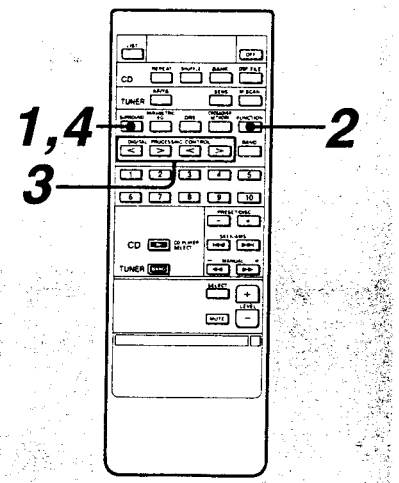
Seat position

When you sit in the front of a room, you will hear more of the direct sound from the front speakers. As you move toward the back of the room, the component of reflected sounds from the front speakers grows. Similarly, the component of reflected sound changes as you move from the left side of the room to the right side. The SEAT POSITION parameter controls the balance of the direct sound and reflected sound to simulate your listening position. With the center position designated as 0 for both front-rear and left-right parameters, you can adjust the position in 50 increments in each direction.



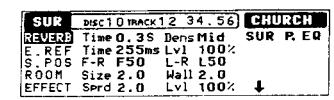
Adjusting SUR Parameters

Adjusting seat position

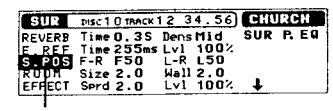


If you want to cancel the operation halfway, press SURROUND for more than 2 seconds.

1 Press SURROUND for more than 2 seconds.
SUR adjustment mode is turned on.


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

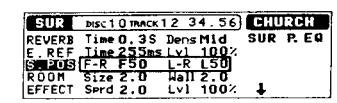
2 Press FUNCTION to select S.POS.


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

"S.POS" is reversed.

3 Use DIGITAL PROCESSING CONTROL to adjust each parameter.

- Press ◁ ▷ ◁ ▷ to move seat position to the front.
- Press ◁ ▷ ◁ ▷ to move seat position to the rear.
- Press ◁ ▷ ◁ ▷ to move seat position to the left.
- Press ◁ ▷ ◁ ▷ to move seat position to the right.


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

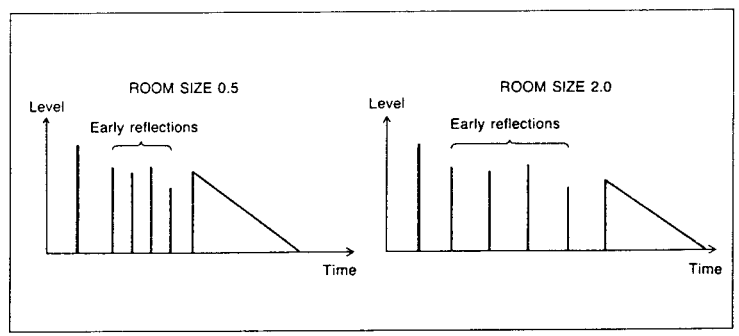
4 When adjustment is finished
Press SURROUND for more than 2 seconds.
The XES-P1 returns to the play mode.

Adjusting SUR Parameters

Room size

The sound emitted from a sound source is reflected many times between the left and right walls, ceiling, and floor before it reach our ears. In a large room, the sound takes more time to bounce from one surface to another than in a smaller room.

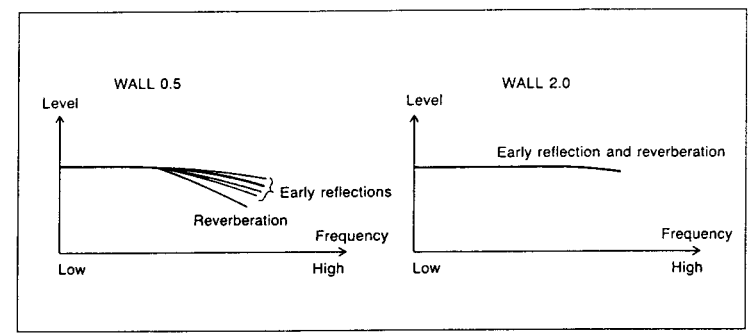
The ROOM SIZE parameter controls the spacing of early reflections to simulate the room size. Using 1.0 for standard room size, you can adjust this parameter from 0.5 to 2.0. The larger the value, the larger the size of the room simulated.



Wall (wall material)

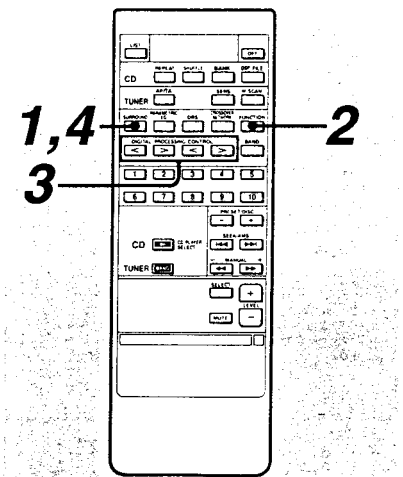
When sound is reflected by a wall made of soft material such as wood or a wall covered with a curtain, the high-frequency components are reduced. A hard wall is highly reflective and does not significantly effect the frequency response of the reflected sound.

The WALL parameter controls the level of high frequencies to simulate the wall material. Using 1 for standard wall made of wood, you can adjust this parameter from 0.5 to 2.0. The larger the value, the harder the wall simulated.



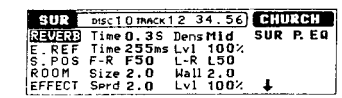
Adjusting SUR Parameters

Adjusting room size and wall material

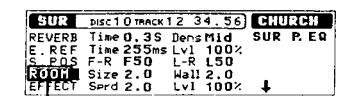


If you want to cancel the operation halfway, press [SURROUND] for more than 2 seconds.

1 Press [SURROUND] for more than 2 seconds.
SUR adjustment mode is turned on.


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

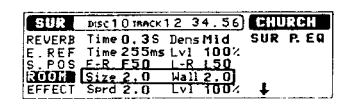
2 Press [FUNCTION] to select ROOM.


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

"ROOM" is reversed.

3 Press [DIGITAL PROCESSING CONTROL] to adjust each parameter.

- Press [<] [>] [<] [>] to decrease room size.
- Press [<] [>] [<] [>] to increase room size.
- Press [<] [>] [<] [>] to soften wall material.
- Press [<] [>] [<] [>] to harden wall material.

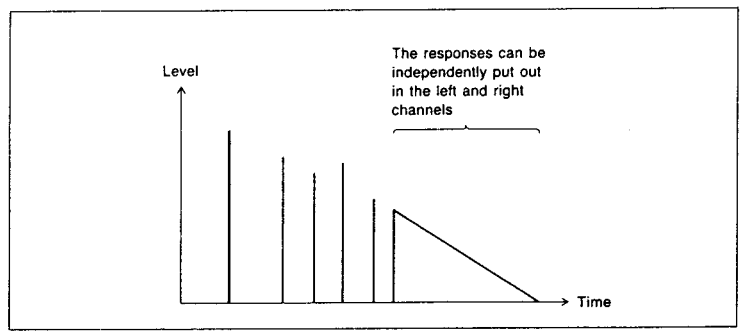

SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E.REF Time 255ms Lvl 100%
S.POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

4 When adjustment is finished
Press [SURROUND] for more than 2 seconds.
The XES-P1 returns to the play mode.

Adjusting SUR Parameters

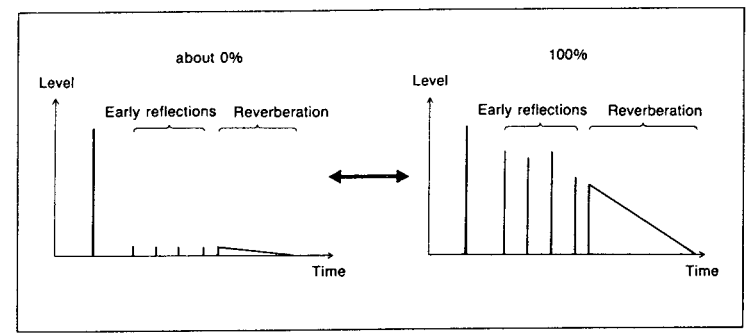
Effect spread

The effect spread parameter adjusts the delay time of the responses in reverberation from the left and right channels to simulate the width of the soundfield. With 1 as the standard value, the adjustable range is from 0.5 to 2.0. The larger the value, the wider the soundfield. (This parameter cannot be adjusted with the digital sound menu JAZZ CLUB, DISCO, THEATER, and SMALL HALL.)



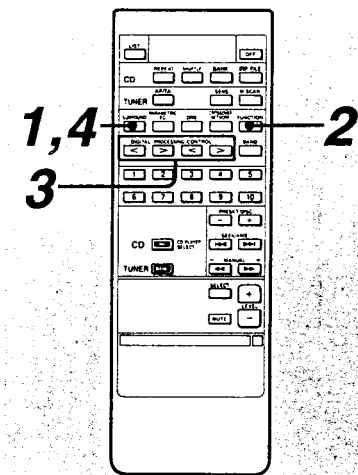
Effect level

This parameter adjusts the level of early reflections and reverberation. The adjustable range is from 0 to 100%; the higher the percentage, the better the liveness you can feel. When it is small, you will feel the room "dead".



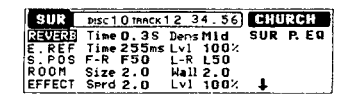
Adjusting SUR Parameters

Adjusting effect spread and level

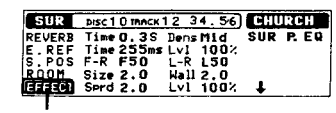


If you want to cancel the operation halfway, press [SURROUND] for more than 2 seconds.

1 **Press [SURROUND] for more than 2 seconds.**
SUR adjustment mode is turned on.


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E. REF Time 255ms Lvl 100%
S. POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

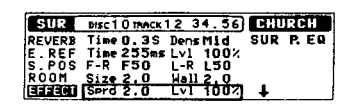
2 **Press [FUNCTION] to select EFFECT.**


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E. REF Time 255ms Lvl 100%
S. POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

"EFFECT" is reversed.

3 **Use [DIGITAL PROCESSING CONTROL] to adjust each parameter.**

- **Press [<][>][<][>] to decrease effect spread.**
- **Press [<][>][<][>] to increase effect spread.**
- **Press [<][>][<][>] to decrease effect level.**
- **Press [<][>][<][>] to increase effect level.**


SUR DISC 1 0 TRACK 1 2 34.56 CHURCH
REVERB Time 0.3S Dens Mid SUR P. EQ
E. REF Time 255ms Lvl 100%
S. POS F-R F50 L-R L50
ROOM Size 2.0 Wall 2.0
EFFECT Sprd 2.0 Lvl 100%

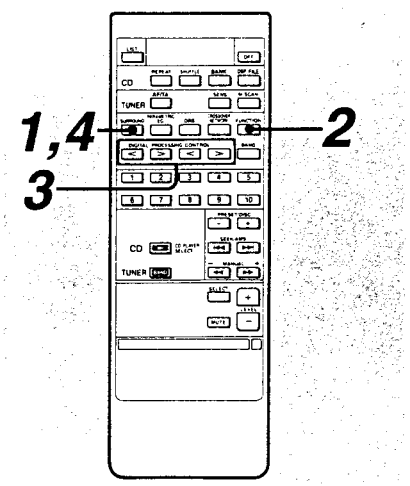
4 **When adjustment is finished**
Press [SURROUND] for more than 2 seconds.
The XES-P1 returns to the play mode.

Adjusting SUR Parameters

Rear (reverberation from the rear) parameter

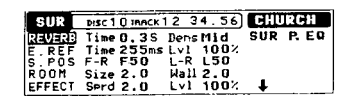
This parameter simulates sound reflected from wall, etc. at the rear side of the listening position. Specifically, it controls the ratio of indirect sound to direct sound.

Adjusting rear parameter

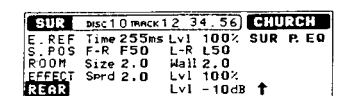


If you want to cancel the operation halfway, press SURROUND for more than 2 seconds.

1 Press SURROUND for more than 2 seconds.
SUR adjustment mode is turned on.

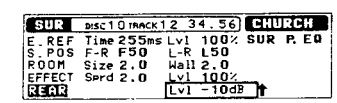


2 Press FUNCTION to scroll the display and select REAR.



"REAR" is reversed.

3 Press DIGITAL PROCESSING CONTROL to adjust the parameter.
- Press ◁ ▷ ◁ ▷ to decrease rear level.
- Press ◁ ▷ ◁ ▷ to increase rear level.



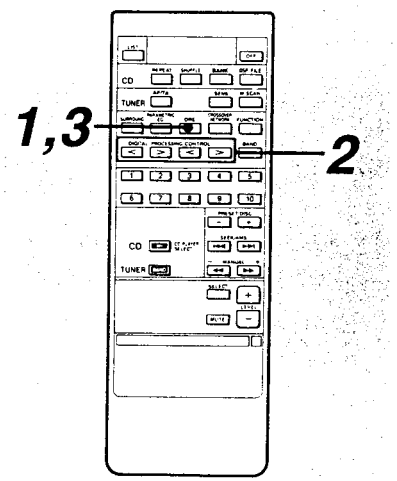
4 When adjustment is finished
Press SURROUND for more than 2 seconds.
The XES-P1 returns to the play mode.

What Is DRS?

The DRS compresses the dynamic range of input signal to increase the average output level without distortion. This function is useful for obtaining dynamic sound at small output levels in a noisy environment.

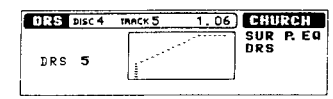
The following section discusses adjusting the DRS parameters. We recommend you to immediately register the parameters once you finish adjusting them. See page 86 on registering DRS.

Adjusting DRS

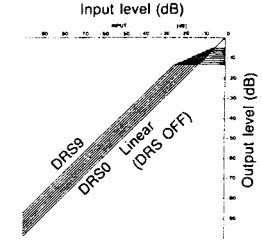


If you want to cancel the operation halfway, press [DRS] for more than 2 seconds.

1 **Press [DRS] for more than 2 seconds.**
DRS adjustment mode is turned on.



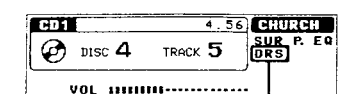
2 **Press [DIGITAL PROCESSING CONTROL] to select the desired DRS effect.**
There are a total of ten DRS effects you can choose from: DRS0-DRS9 (DRS0 = DRS off).
- **Press [◁][▷][◁][▷] to decrease DRS effect.**
- **Press [◁][▷][◁][▷] to increase DRS effect.**



3 **When adjustment is finished**
Press [DRS] for more than 2 seconds.
The XES-P1 returns to the play mode.

To see if DRS is in effect
- **Press [DRS].**

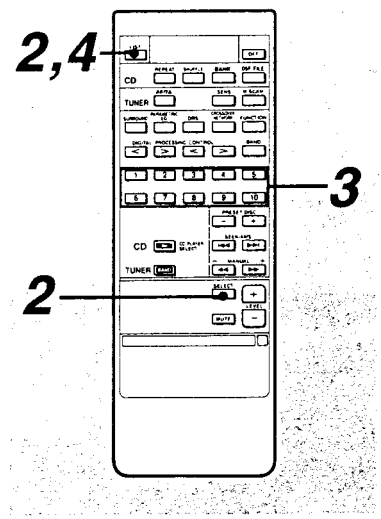
When the effect is on, DRS appears in the display window. When the effect is off, DRS goes off. Listen to the play sound with and without the DRS effect to check how the DRS modifies the sound.



"DRS" is displayed when the DRS is in effect.

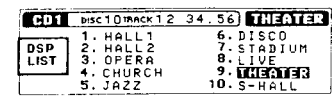
Registering Adjusted DSP

You can entitle and register up to 10 soundfield programs (combination of P.EQ, SUR, and DRS settings).



1 **Adjust each of P.EQ, SUR, and DRS.**
(For adjustment method, see pages 56 to 59 on P.EQ, pages 60 to 83 on SUR, and pages 84 to 85 on DRS.)

2 **Press [SELECT], followed by the [LIST] if the XES-P1 is in the play mode. Or press [LIST] if the XES-P1 is in the adjustment mode.**
The digital sound menu list is displayed.



3 **Press the numeric button on which you want to register the soundfield program for more than 2 seconds.**
The adjusted soundfield program is assigned to that button.
Registration is finished when the beep tone is heard for the second time.

4 **Press [LIST].**
The XES-P1 returns to the playback mode.

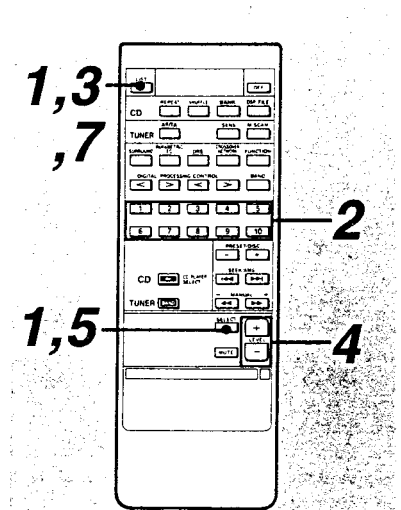
To restore to the factory preset value*1 of SUR

You can restore the factory preset value of SUR, and register it to a digital sound menu desired.

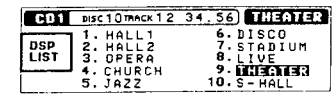
*1 Surround mode registered at the factory

1 **Display the digital sound menu list.**
2 **While pressing [SELECT], press [5] (one of the numeric buttons).**
The surround call list is displayed. The surround call list stands for the factory preset value list.
3 **Press a numeric button to select the digital sound menu to be recalled.**
The factory preset values are recalled.
4 **Press [LIST].**
The digital sound menu is displayed.
5 **Press the numeric button onto which you want to register the factory preset parameters.**
Press the button for more than 2 seconds.
Registration is finished when the beep tone is heard for the second time.
6 **Press [LIST].**
The XES-P1 returns to the play mode.

Changing the title of registered soundfield programs

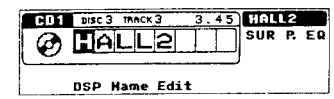


1 **Press [SELECT], followed by the [LIST] if the XES-P1 is in the play mode. Or press [LIST] if the XES-P1 is in the adjustment mode.**
The digital sound menu is displayed.



2 **Press the corresponding numeric button to select the soundfield program title to change.**

3 **Press [LIST] for more than 2 seconds.**
The digital sound menu is ready for modification.



4 **Press [-LEVEL+] to select character or symbol for input.**
Press [+] to go to the next character or symbol.
Press [-] to go to the previous character or symbol.
See page 29 for the usable characters and symbols.

5 **Press [SELECT] to input character or symbol.**
The cursor moves to the next position for further input.

6 **Repeat steps 4 to 5.**

7 **When the new title is input**
Press [LIST] for more than 2 seconds.
The new title is registered, and the XES-P1 returns to the playback mode.

If you create a new soundfield program but forget to register it, it would be erased.

Be sure to register it by giving a title after you have created a soundfield program.

Adjusting Crossover Network (CNW)

(This applies only if the optionally available digital crossover network XES-X1 is connected to use this processing preamplifier in multi-channel amplification system.)

What Is Multi-channel Amplification System?

Multi-channel amplification system assigns audio signal to each frequency band on the crossover network, amplifies it using dedicated amplifier, and reproduces it through dedicated speakers. Because the amplifiers and speakers directly access each frequency band so that any interference between bands during signal transmission is completely eliminated,

- you can use amplifiers and speakers designed to work with particular frequency bands
- you can minimize distortion due to amplifier circuit, particularly inter-modulation distortion that deteriorates the tone quality
- as speakers and amplifiers do not require dividing network between them, but can be connected directly, it is now possible to use speakers dedicated to each frequency band to make the most of the speakers characteristics
- as the counter-electromotive force from low frequency band speakers affecting the high frequency band amplifier is absent, it becomes easier to drive each amplifier

In particular, because XES-X1 processes all audio signal in their original digital signal form, it is now possible to reproduce the same quality of original soundfield with the feel of "liveness" even when you are driving in a car.

Adjustable Parameters

You can adjust the following parameters:

- Level and cross frequency of each frequency band
  You can adjust each frequency band speaker and amplifier to bring out the best soundfield performance.
- Time alignment
  (See page 92 on calculation of time alignment.)
- Phase of each frequency band speaker

Usually, when a multi-speaker system is installed in a car, the speakers with smaller diameters for high and middle frequencies are placed close at the front seat or door, and the ones with large diameters for low frequency are placed close to the back seat or in a trunk. In this setup, because the low frequency speakers and the middle and high frequency speakers are placed at a distance, the person sitting at the front will hear the low frequency later than the overall frequency.

Also, many materials inside the car — such as window glass — are highly reflective, the reflected sound may cause phase shift and affect the soundfield.
If this happens, use the XES-X1 to adjust the time alignment and phase of each frequency speaker in consideration of the speaker's location as well as the listening position.
Read the Operating Instructions of the XES-X1 before connecting this equipment to XES-X1 and speakers.
Also, adjustment of the crossover network requires knowledge of each component as well as experience in the equipment.
When adjustment is not done properly, the speakers and amplifiers may be damaged. If you cannot do the adjustment, contact your local dealer for assistance.

CNW adjustment procedure
(3-way and 4-way speakers system must be preset at XES-X1.)

1 Select the band (speaker) to be adjusted.
2 Adjust the cross frequency and level of the selected band.
3 Adjust the time alignment of the selected band.
4 Adjust the phase of the selected band.
Select next band.

We recommend you to immediately register the adjustment.

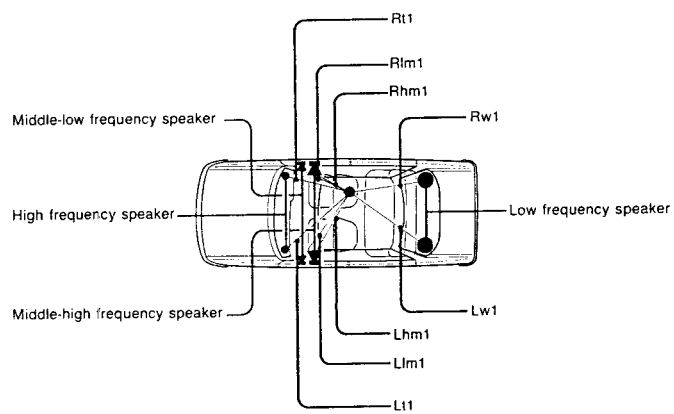
Finding time alignment value

• To find time alignment value for the driver's seat on the right steering wheel

1 **Sit on the driver's seat and measure the distance between your ears (left and right) and each speaker.**

Lt1 : distance between left ear and left high frequency speaker
Lhm1: distance between left ear and left middle-high frequency speaker
Llm1: distance between left ear and left middle-low frequency speaker
Lw1: distance between left ear and left low frequency speaker

Rt1 : distance between right ear and right high frequency speaker
Rhm1: distance between right ear and right middle-high frequency speaker
Rlm1: distance between right ear and right middle-low frequency speaker
Rw1: distance between right ear and right low frequency speaker



Distance is measured in meters.

2 **Add the base value of each speaker to the distance obtained in step 1.**

(The base value is the time delay from each speaker converted into distance.)

Base value of each speaker
High frequency speaker : 0
Middle-high frequency speaker : 0.05
Middle-low frequency speaker : 0.09
Low frequency speaker : 0.16
All units are in meters.

Lt2 = Lt1 + 0
Lhm2 = Lhm1 + 0.05
Llm2 = Llm1 + 0.09
Lw2 = Lw1 + 0.16

Rt2 = Rt1 + 0
Rhm2 = Rhm1 + 0.05
Rlm2 = Rlm1 + 0.09
Rw2 = Rw1 + 0.16

3 **Using the speaker furthest from the driver's seat as the standard (the low frequency speaker on the left if steering wheel is on the right), measure the distance of the remaining speakers (high, middle-high, and middle-low frequency speakers) from the standard speaker.**

L1 = Lw2 – Lt2
L2 = Lw2 – Lhm2
L3 = Lw2 – Llm2
L4 = 0

R1 = Lw2 – Rt2
R2 = Lw2 – Rhm2
R3 = Lw2 – Rlm2
R4 = Lw2 – Rw2

4 **Find the time difference by dividing the distance difference by the sound velocity.**

(Sound velocity: 340m/sec at 1 atm, 15°C)

Tl1 = L1/340
Tl2 = L2/340
Tl3 = L3/340
Tl4 = 0

Tr1 = R1/340
Tr2 = R2/340
Tr3 = R3/340
Tr4 = R4/340

Adjusting Crossover Network (CNW)

(This applies only if the optionally available digital crossover network XES-X1 is connected to use this processing preamplifier in multi-channel amplification system.)

Finding time alignment value for both the driver's seat and the front seat

(for car with steering wheel on the right or the left)
At step 1, find out the middle position between the driver's and the front seats, and measure the distance from this position to each speaker. Because Lt1 = Rt1, Lhm1 = Rhm1, Llm1 = Rlm1, Lw1 = Rw1, then R4 = 0, and Tl1 = Tr2, Tl2 = Tr2, Tl3 = Tr3, Tl4 = Tr4 = 0.

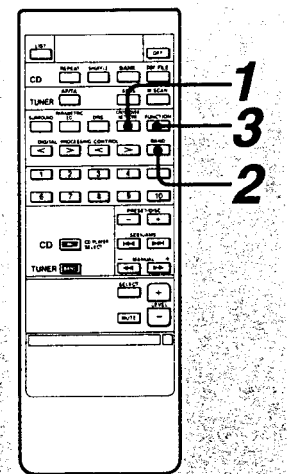
Finding time alignment value with the driver's seat on the left

Change the calculation in step 3 to:

L1 = Rw2 – Lt2
L2 = Rw2 – Lhm2
L3 = Rw2 – Llm2
L4 = Rw2 – Lw2

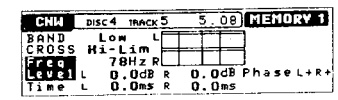
R1 = Rw2 – Rt2
R2 = Rw2 – Rhm2
R3 = Rw2 – Rlm2
R4 = 0

Adjusting CNW



If you want to cancel the operation halfway, press [CROSSOVER NETWORK] for more than 2 seconds.

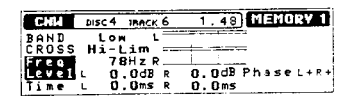
1 **Press [CROSSOVER NETWORK] for more than 2 seconds.**
CNW adjustment mode is turned on.

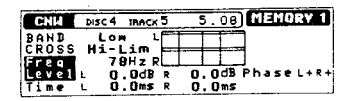


2 **Press [BAND] to select the frequency band to be adjusted.**
Pressing [BAND] continuously will cycle through
For a 3-way system: ┌→ Low → Mid → High ┐

For a 4-way system: ┌→ Low → Lo-Mid ┐
└ High ← Hi-Mid ←┘

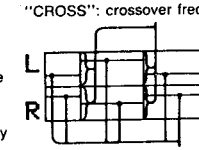
(Setting of 3-way or 4-way system is done at XES-X1 when installing speakers.)





Adjusting network
When adjusting "Band High" (for high frequency speakers), set "CROSS" (crossover frequency) to "Lo-Lim" (lowest crossover frequency that can be received by high frequency speakers).
For other bands (medium and low frequency for the speakers), set "CROSS" to "Hi-Lim" (maximum crossover frequency for the speakers).
When the band is selected, "CROSS" automatically changes to either "Hi-Lim" or "Lo-Lim".

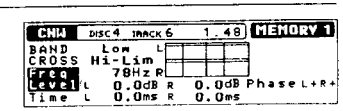
"CROSS": crossover frequency indicator



Crossover values on the display window

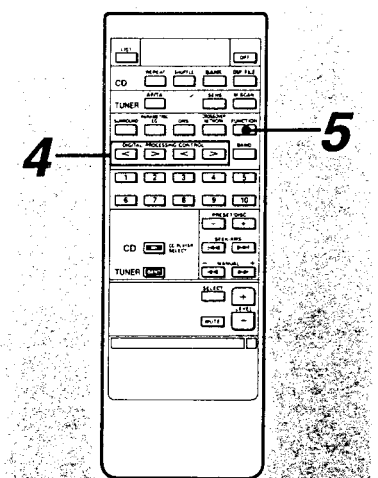
"Level": output level of each speaker

3 **Press [FUNCTION] to select "Freq" and "Level".**
"Freq" and "Level" are reversed.



to be continued ⇨

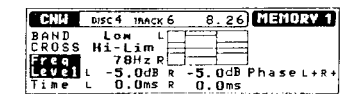
Adjusting CNW



Continued

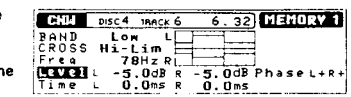
4 Press DIGITAL PROCESSING CONTROL to adjust the selected band output level and cross frequency.

- Press ◁▷◁▷ to increase output level.
- Press ◁▷◁▷ to decrease output level.
- Press ◁▷◁▷ to shift cross frequency up.
- Press ◁▷◁▷ to shift cross frequency down.



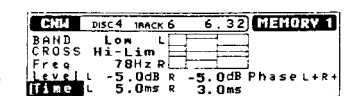
To independently adjust the output level of the left and right channels

- Press FUNCTION to select "Level".
- Press ◁▷◁▷ to increase output level of the left channel.
- Press ◁▷◁▷ to decrease output level of the left channel.
- Press ◁▷◁▷ to increase output level of the right channel.
- Press ◁▷◁▷ to decrease output level of the right channel.



5 Press FUNCTION to select time.

- Press ◁▷◁▷ to increase the time delay of the left speaker.
- Press ◁▷◁▷ to decrease the time delay of the left speaker.
- Press ◁▷◁▷ to increase the time delay of the right speaker.
- Press ◁▷◁▷ to decrease the time delay of the right speaker.



"Time" is reversed.

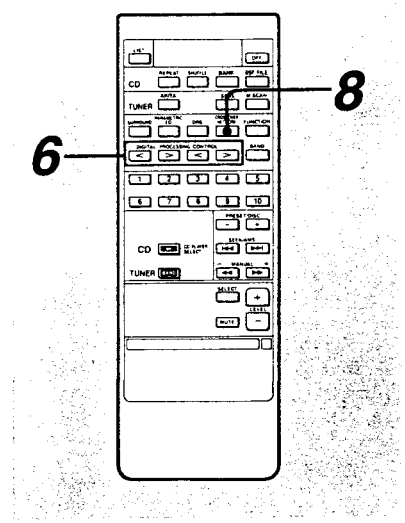
Specifically, use the values calculated in page 92 to 94 to set.

TI1 : time delay of left high frequency speaker
TI2: time delay of left middle-high frequency speaker
TI3 : time delay of left middle-low frequency speaker
TI4 : time delay of left low frequency speaker
Tr1 : time delay of right high frequency speaker
Tr2 : time delay of right middle-high frequency speaker
Tr3 : time delay of right middle-low frequency speaker
Tr4 : time delay of right low frequency speaker

Fine tune it while you are listening to the music.

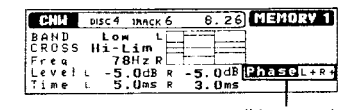
to be continued ⇨

Adjusting CNW



Continued

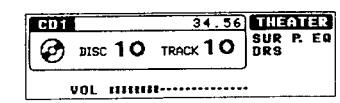
6 Press [FUNCTION] to adjust the phase.
- Press [<][>][<][>] to turn phase of the left channel output to positive.
- Press [<][>][<][>] to turn phase of the left channel output to negative.
- Press [<][>][<][>] to turn phase of the right channel output to positive.
- Press [<][>][<][>] to turn phase of the right channel output to negative.



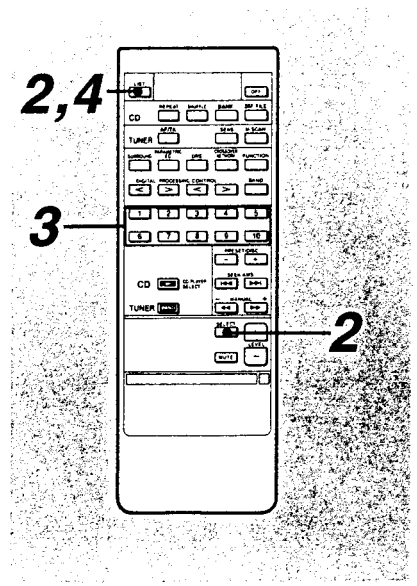
"Phase" is reversed.

7 To adjust other bands
Repeat steps 2 to 6.

8 When adjustment is finished
Press [CROSSOVER NETWORK] for more than 2 seconds.
The XES-P1 returns to the play mode.



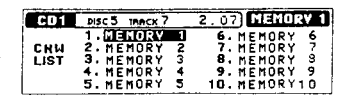
Registering Adjusted CNW



You can register up to 10 adjusted CNW settings to the crossover list.

1 **Adjust CNW.**
(See pages 90 to 101 on adjusting CNW.)

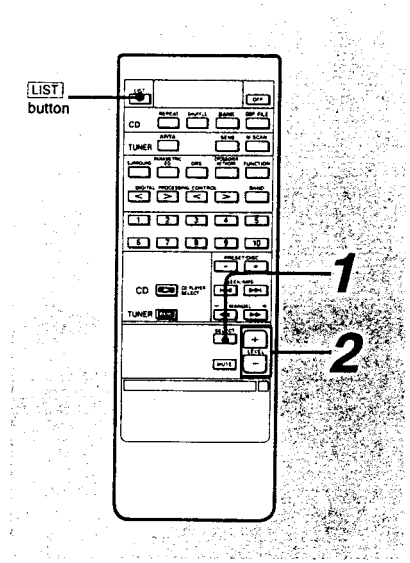
2 **Press [SELECT] twice if the XES-P1 is in the play mode.**
Or press [LIST] if the XES-P1 is in the adjustment mode.
The crossover list is displayed.



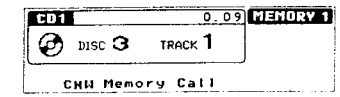
3 **Press the corresponding numeric button for more than 2 seconds to register the setting.**
The setting is assigned to the numeric button.
When a beep tone is heard for the second time, registration is finished.

4 **Press [LIST].**
The XES-P1 returns to the play mode.

Retrieving Registered Crossover Settings

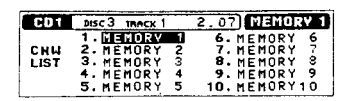


1 **Press [SELECT] twice while the XES-P1 is in the play mode.**
The crossover menu flashes.



• To display the crossover list
Press [LIST].
The crossover list is displayed.

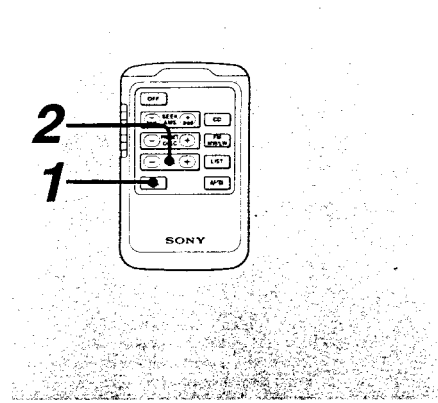
2 **Press [–LEVEL+] to select the desired crossover menu.**
• Press [+] to go to the next menu.
• Press [–] to return to the previous menu.
You can use the numeric buttons to select the menu.



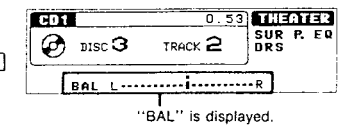
To return to the play mode from the crossover list
Press [LIST].

You can change the title of registered crossover settings in the same way as for the soundfield programs. (See page 88.)

Adjusting the Balance of Left and Right Speakers



1 Press [SEL] to display "BAL".
Pressing [SEL] continuously cycle through
DSP menu (flashing) → CNW menu (flashing) → VOL ← FADER ← BALANCE

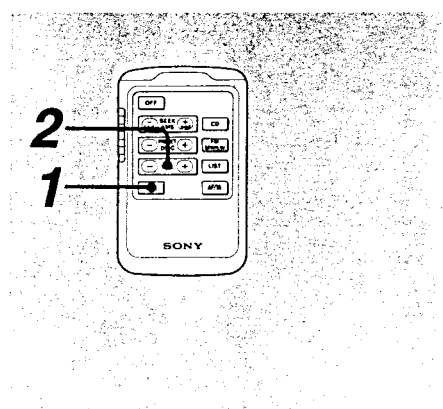


"BAL" is displayed.

2 Press [-VOL+] to adjust the balance of the left and right speakers.
- Press [+] to increase the volume of the right speaker.
- Press [-] to increase the volume of the left speaker.

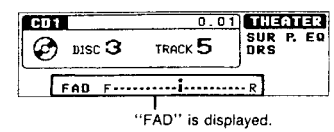
To return to sound volume display
- Press [SEL] twice. (If [SEL] is not pressed, after about 8 seconds have elapsed, the XES-P1 will automatically return to the sound volume display.)

Adjusting the Balance of Front and Rear Speakers



To adjust the volume of the rear speakers

1 Press [SEL] 4 times to display "FAD".



"FAD" is displayed.

2 Press [-VOL+] to adjust the balance of the front and rear speakers.
- Press [+] to increase the volume of the rear speaker.
- Press [-] to increase the volume of the front speaker.

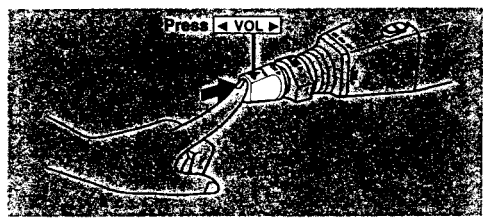
To return to sound volume display
- Press [SEL] once. (If [SEL] is not pressed, after about 8 seconds have elapsed, the XES-P1 will automatically return to the sound volume display.)

© 1991 by Sony Corporation Printed in Japan

The directions used in this Operating instructions, for example increasing or decreasing the sound volume, assume you have installed the joystick commander to the left side of the steering wheel cover.
If you want to install it to the right side, change the position of the commander mode switch in order to use the same directions.
For details, see "Installation/Connection".

Basic Operation

Turning the Power On/Listening to the CD or the Radio

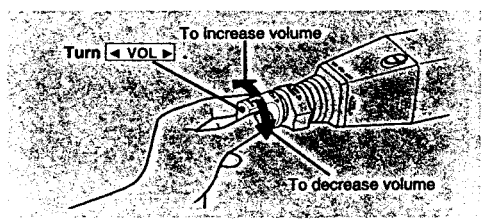


The power is turned on, and either the CD play or the reception of the radio program begins.

- To change from CD play to radio reception, press ◄ VOL ►.
- To change from radio reception to CD play, press ◄ VOL ►.

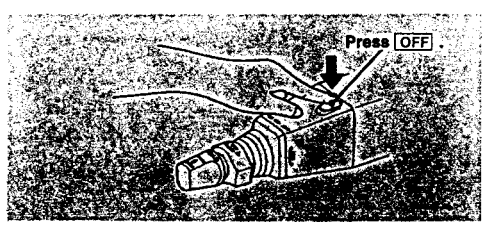
Pressing ◄ VOL ► guides you between CD play and radio reception.

Adjusting Volume



Release ◄ VOL ► at the desired volume.

Turning the Power Off

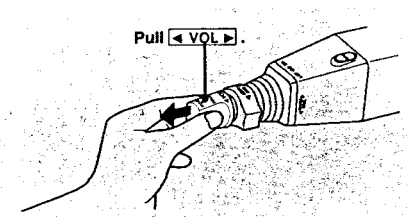


The power is turned off.

Basic Operation

Radio Operations

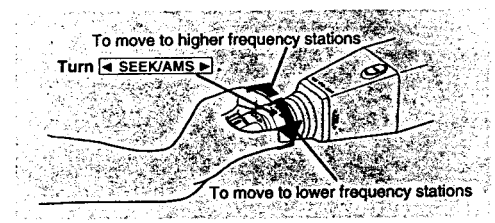
Selecting the Desired Band



Each time you pull ◄ VOL ►, the band changes in the following order:

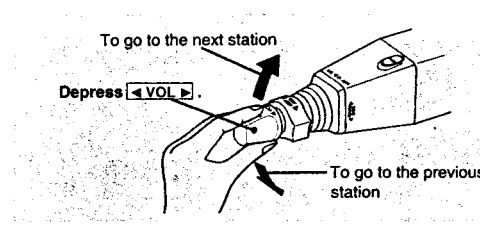
FM1 → FM2 → MW → LW

Scanning the Stations *(AutomaticTuning)*



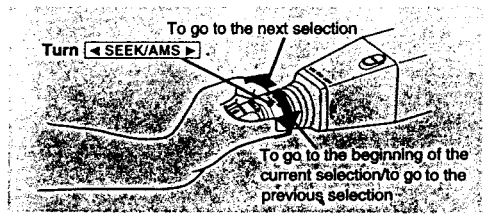
When a station is tuned in, scanning stops. Repeat until the desired station is tuned in.

Tuning in a Preset Station *(Memory Preset Tuning)*



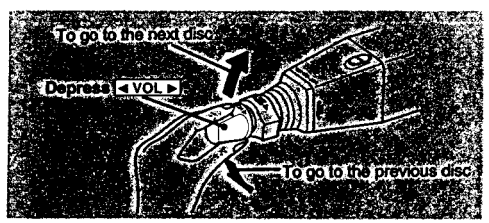
Have the stations memorized before bringing about the memory preset tuning. See pages 36 and 37 of the operating instructions for memorizing stations.

Choosing the Selection to Play



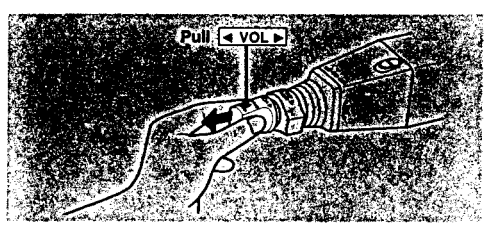
Release ◄ SEEK/AMS ► at the desired selection.

Selecting Disc



Changing the CD Changer

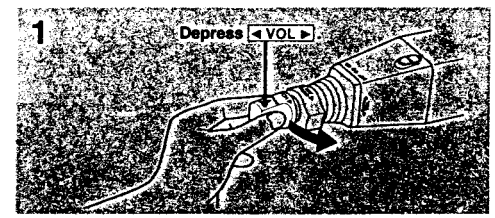
(when two or more CD changers are connected to your XES-P1)



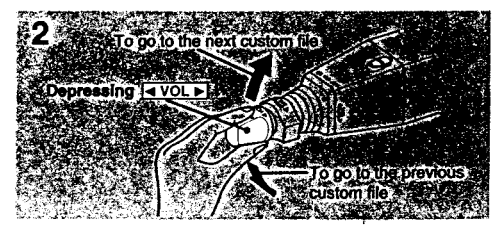
Each time you pull ◄ VOL ►, the active changer changes in the following order:

→ CD1 → CD2 → •••• →

Selecting the Custom File for CD Play

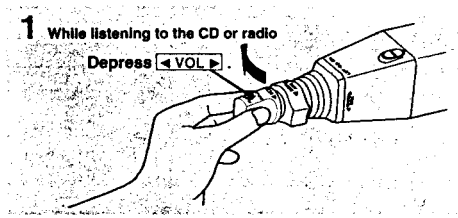


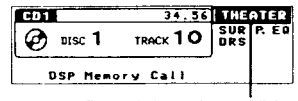
The custom file list will be displayed. Note:Do not keep ◄ VOL ► pressed for more than 2 seconds. Otherwise the registration mode (see page 51 of the operating instructions) will be entered.



Select the disc to be played by depressing ◄ VOL ► and move to ◄ PRESET/DISC ►

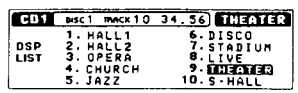
Simulating Acoustic Situations
(Digital Sound Menu)



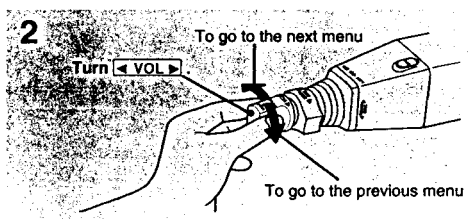


The digital sound menu blinks.

To display the digital sound menu → Depress ◄ VOL ► and move to LIST ◄.



The digital sound menu is displayed.



To turn off the digital sound menu

Depress ◄ VOL ► and move to LIST ◄.

Note:Do not keep ◄ VOL ► pressed for more than 2 seconds. Otherwise the registration mode (see page 51 of the operating instruction) will be entered.

Caution

- Before making connections, disconnect the ground terminal of the car battery to avoid short circuit.
- Be sure to connect the red power input lead to the positive 12 V power terminal. This terminal receives power when the ignition key is in the accessory position.

The name and functions of each lead from the XES-X1 can be determined by its color as described below.

Red	Power input lead
Gray	Remote controlinput lead
Violet/White striped	A/D (analog/digital) selection lead
Blue/White striped	Power amplifier activation lead

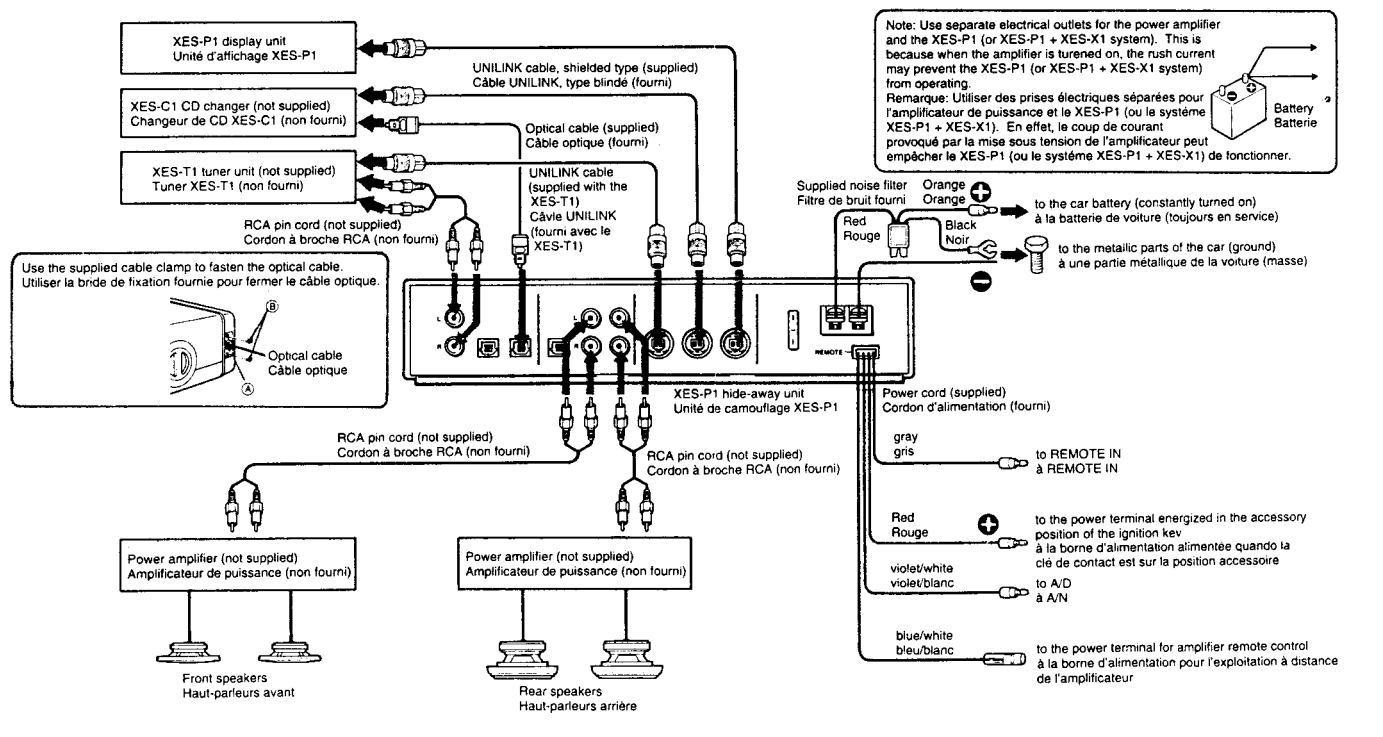
Précautions

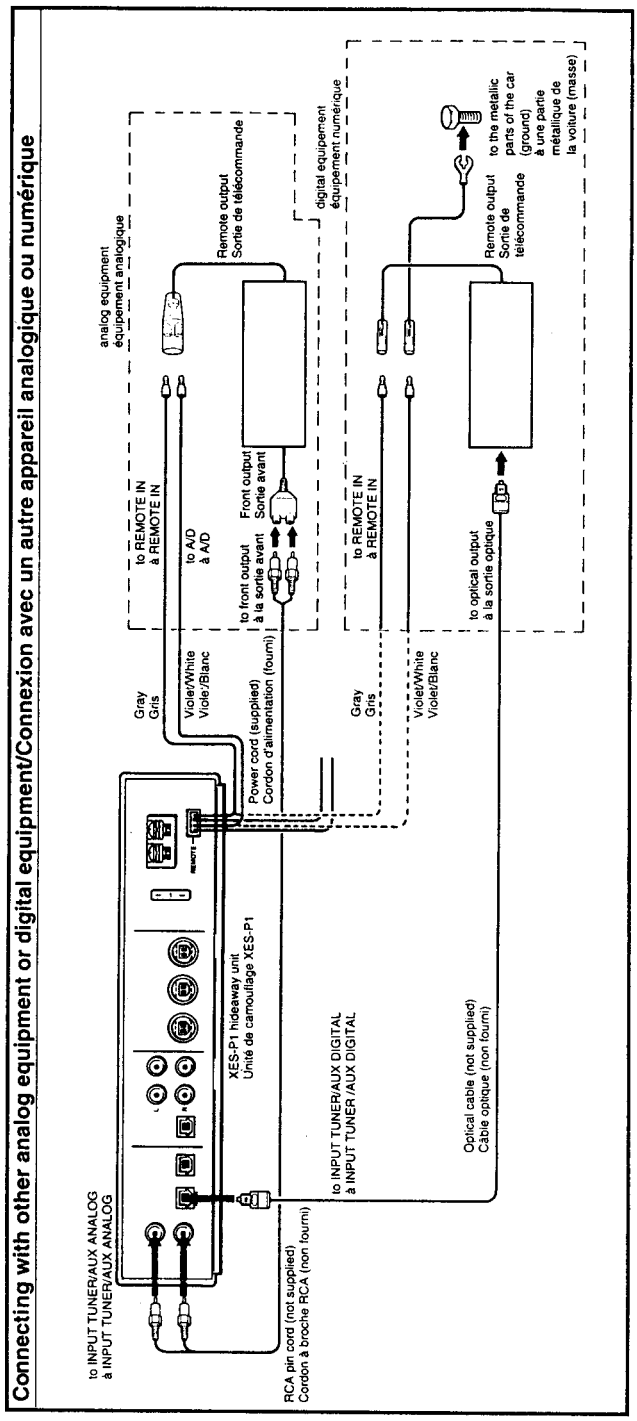
- Avant d'effectuer les connexions, déconnecter la borne de la masse de la batterie de voiture pour éviter un court-circuit.
- S' assurer de connecter le fil d'entrée d'alimentation rouge à la borne d'alimentation positive de 12 V. Cette borne reçoit l'alimentation lorsque la clé de contact est en position accessoire.

Le nom et les fonctions de chaque fil du XES-X1 peuvent être déterminés par la couleur de celui-ci comme décrit ci-dessous.

Rouge	Fil d'entrée d'alimentation
Gris	Fil d'entrée de commande à distance
Rayé violet/ blanc	Fil de sélection analogique/ numérique (A/N)
Rayé bleu/ blanc	Fil de mise sous tension de l'amplificateur

Basic Connection/Connexion fondamentale


XES-P1 display unit
Unité d'affichage XES-P1
XES-C1 CD changer (not supplied)
Changeur de CD XES-C1 (non fourni)
XES-T1 tuner unit (not supplied)
Tuner XES-T1 (non fourni)
UNILINK cable, shielded type (supplied)
Câble UNILINK, type blindé (fourni)
Optical cable (supplied)
Câble optique (fourni)
UNILINK cable (supplied with the XES-T1)
Câvle UNILINK (fourni avec le XES-T1)
RCA pin cord (not supplied)
Cordon à broche RCA (non fourni)
Use the supplied cable clamp to fasten the optical cable.
Utiliser la bride de fixation fournie pour fermer le câble optique.
Optical cable
Câble optique
Note: Use separate electrical outlets for the power amplifier and the XES-P1 (or XES-P1 + XES-X1 system). This is because when the amplifier is turened on, the rush current may prevent the XES-P1 (or XES-P1 + XES-X1 system) from operating.
Remarque: Utiliser des prises électriques séparées pour l'amplificateur de puissance et le XES-P1 (ou le systéme XES-P1 + XES-X1). En effet, le coup de courant provoqué par la mise sous tension de l'amplificateur peut empêcher le XES-P1 (ou le systéme XES-P1 + XES-X1) de fonctionner.
Battery
Batterie
Supplied noise filter
Filtre de bruit fourni
Orange
Orange
Red
Rouge
Black
Noir
to the car battery (constantly turned on)
à la batterie de voiture (toujours en service)
to the metallic parts of the car (ground)
à une partie métallique de la voiture (masse)
XES-P1 hide-away unit
Unité de camouflage XES-P1
Power cord (supplied)
Cordon d'alimentation (fourni)
RCA pin cord (not supplied)
Cordon à broche RCA (non fourni)
RCA pin cord (not supplied)
Cordon à broche RCA (non fourni)
gray
gris
to REMOTE IN
à REMOTE IN
Red
Rouge
to the power terminal energized in the accessory position of the ignition key
à la borne d'alimentation alimentée quando la clé de contact est sur la position accessoire
violet/white
violet/blanc
to A/D
à A/N
blue/white
bleu/blanc
to the power terminal for amplifier remote control
à la borne d'alimentation pour l'exploitation à distance de l'amplificateur
Power amplifier (not supplied)
Amplificateur de puissance (non fourni)
Power amplifier (not supplied)
Amplificateur de puissance (non fourni)
Front speakers
Haut-parleurs avant
Rear speakers
Haut-parleurs arrière

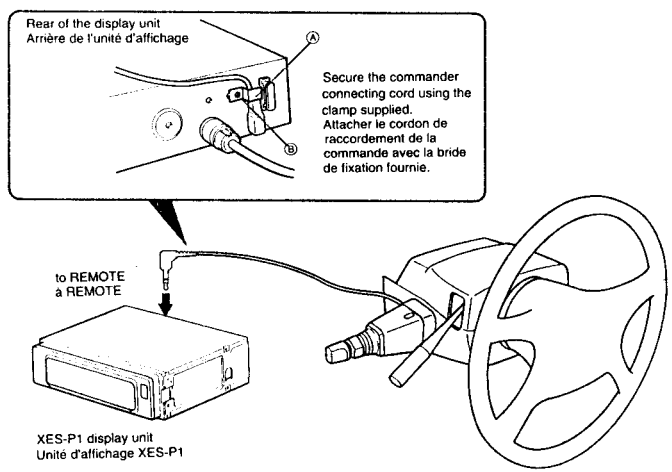

Connecting with other analog equipment or digital equipment/Connexion avec un autre appareil analogique ou numérique
analog equipment
équipement analogique
digital equipment
équipement numérique
to REMOTE IN
à REMOTE IN
to A/D
à A/D
Remote output
Sortie de télécommande
Front output
Sortie avant
to front output
à la sortie avant
Gray
Gris
Violet/White
Violet/Blanc
Power cord (supplied)
Cordon d'alimentation (fourni)
to optical output
à la sortie optique
to the metallic parts of the car (ground)
à une partie métallique de la voiture (masse)
to INPUT TUNER/AUX ANALOG
à INPUT TUNER/AUX ANALOG
XES-P1 hideaway unit
Unité de camouflage XES-P1
RCA pin cord (not supplied)
Cordon à broche RCA (non fourni)
to INPUT TUNER/AUX DIGITAL
à INPUT TUNER/AUX DIGITAL
Optical cable (not supplied)
Câble optique (non fourni)

How to Connect the Joystick Commander
Connexion de la commande joystick

Connection/Connexion

Connect the Joystick commander to the XES-P1 display unit.
Connect the commander before installing the XES-P1 itself.

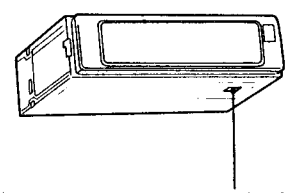
Raccorder la commande joystick à l'unité d'affichage XES-P1.
Brancher la commande avant d'installer la XES-P1 elle-même.


Rear of the display unit
Arrière de l'unité d'affichage
Ⓐ
Ⓑ
Secure the commander connecting cord using the clamp supplied.
Attacher le cordon de raccordement de la commande avec la bride de fixation fournie.
to REMOTE
à REMOTE
XES-P1 display unit
Unité d'affichage XES-P1

Setting the Commander Mode Selector
Réglage du sélecteur de mode de la commande

Set the commander mode selector (at the bottom of the display unit) according to the joystick commander position (left side or right side of the steering wheel cover).
For example, to decrease the sound volume by turning ◄ VOL ► toward you and to increase it by turning ◄ VOL ► in the opposite direction, set the selector as follows:
When the commander is affixed to the left side of the steering wheel cover, set the selector to the left position.
When the commander is affixed to the right side of the steering wheel cover, set the selector to the right position.

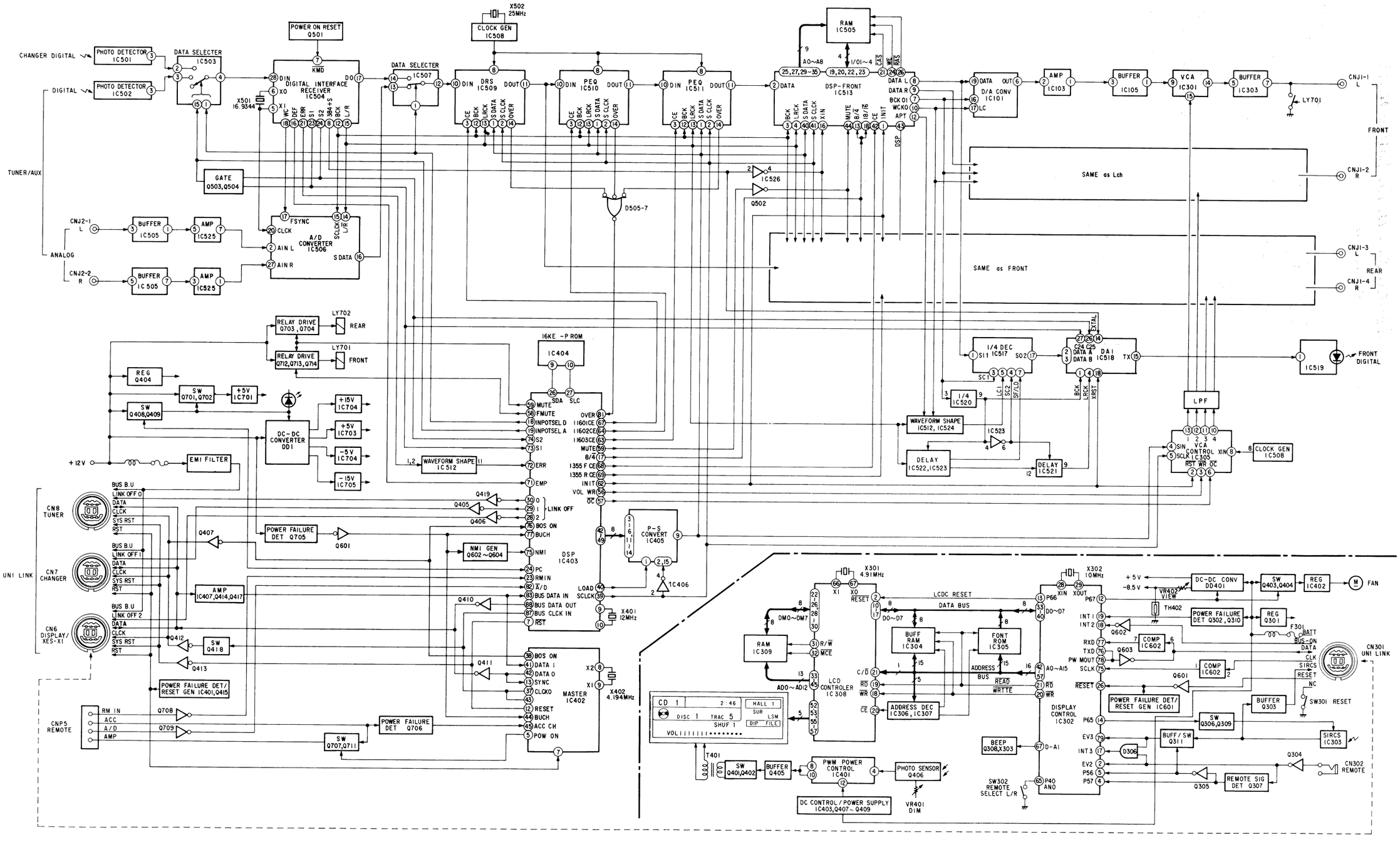
Régler le sélecteur de mode de la commande (situé sur le fond de l'unité d'affichage) en fonction de l'emplacement de la commande joystick, c'est-à-dire à gauche ou à droite du cache du volant.
Par exemple, pour diminuer le volume sonore en tournant ◄ VOL ► vers soi ou pour l'augmenter en tournant ◄ VOL ► dans le sens opposé, régler le sélecteur comme suit.
Quand la commande est fixée à la gauche du cache du volant, régler le sélecteur sur la position gauche.
Quand la commande est fixée à la droite du cache du volant, régler le sélecteur sur la position droite.



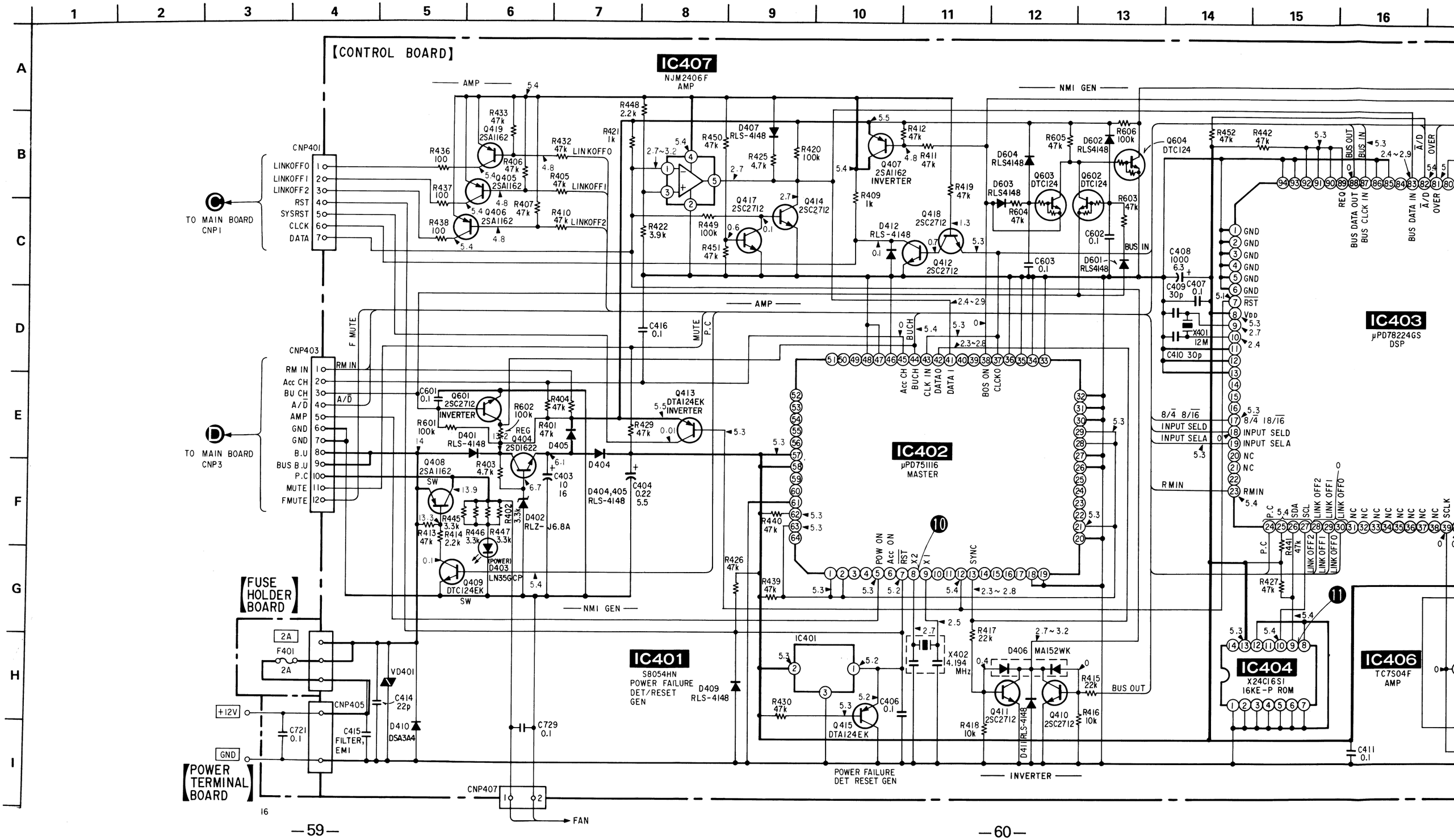
Commander mode selector
Set to the position desired with the tip of a ball-point pen or a similar object.
Sélecteur de mode de la commande
Le régler sur la position souhaitée avec la pointe d'un stylo à bille ou d'un objet similaire.

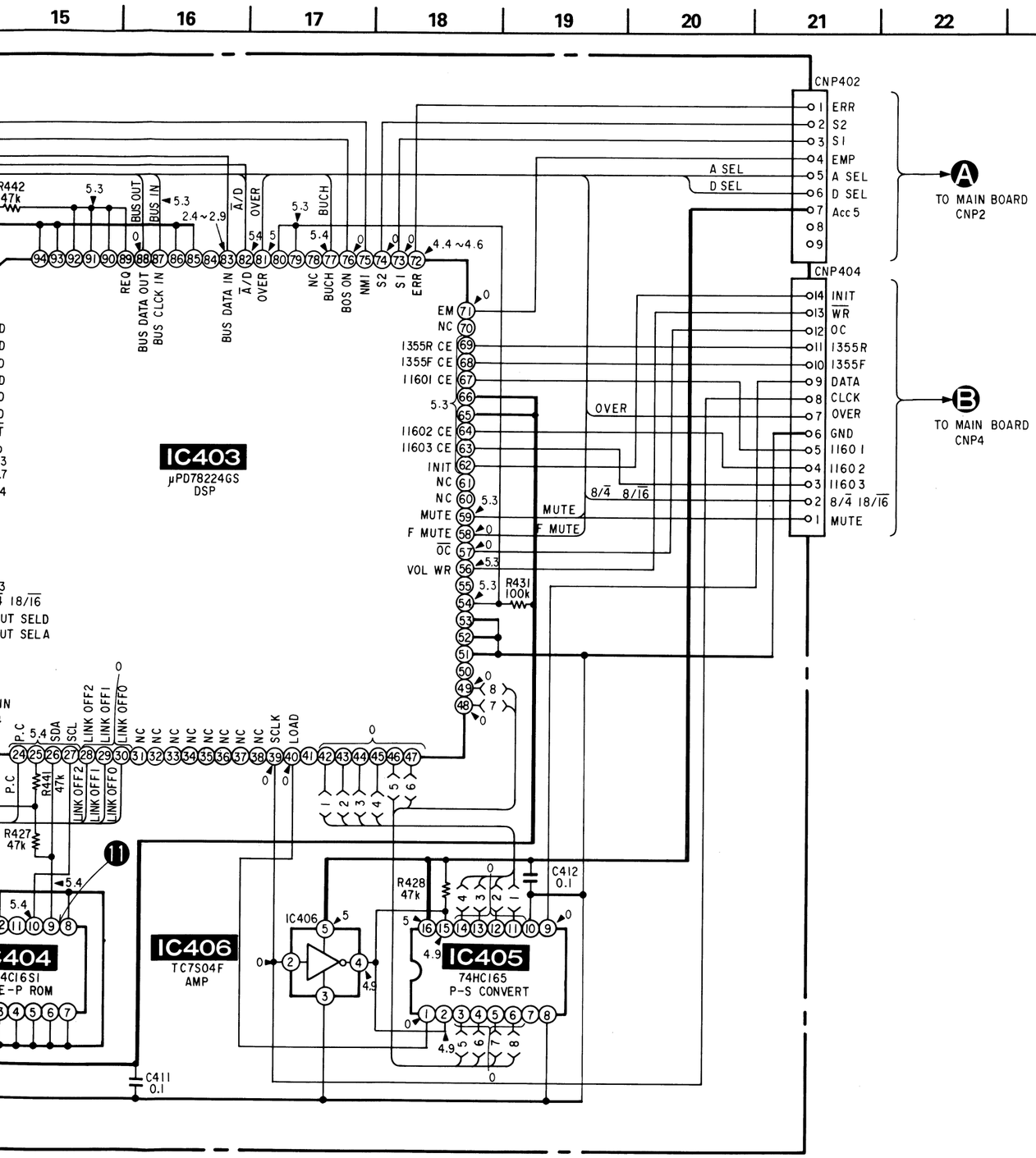
SECTION 2
DIAGRAMS

2-1. BLOCK DIAGRAM



2-2. SCHEMATIC DIAGRAM – CONTROL BOARD SECTION – • See page 82 for IC Block Diagrams.

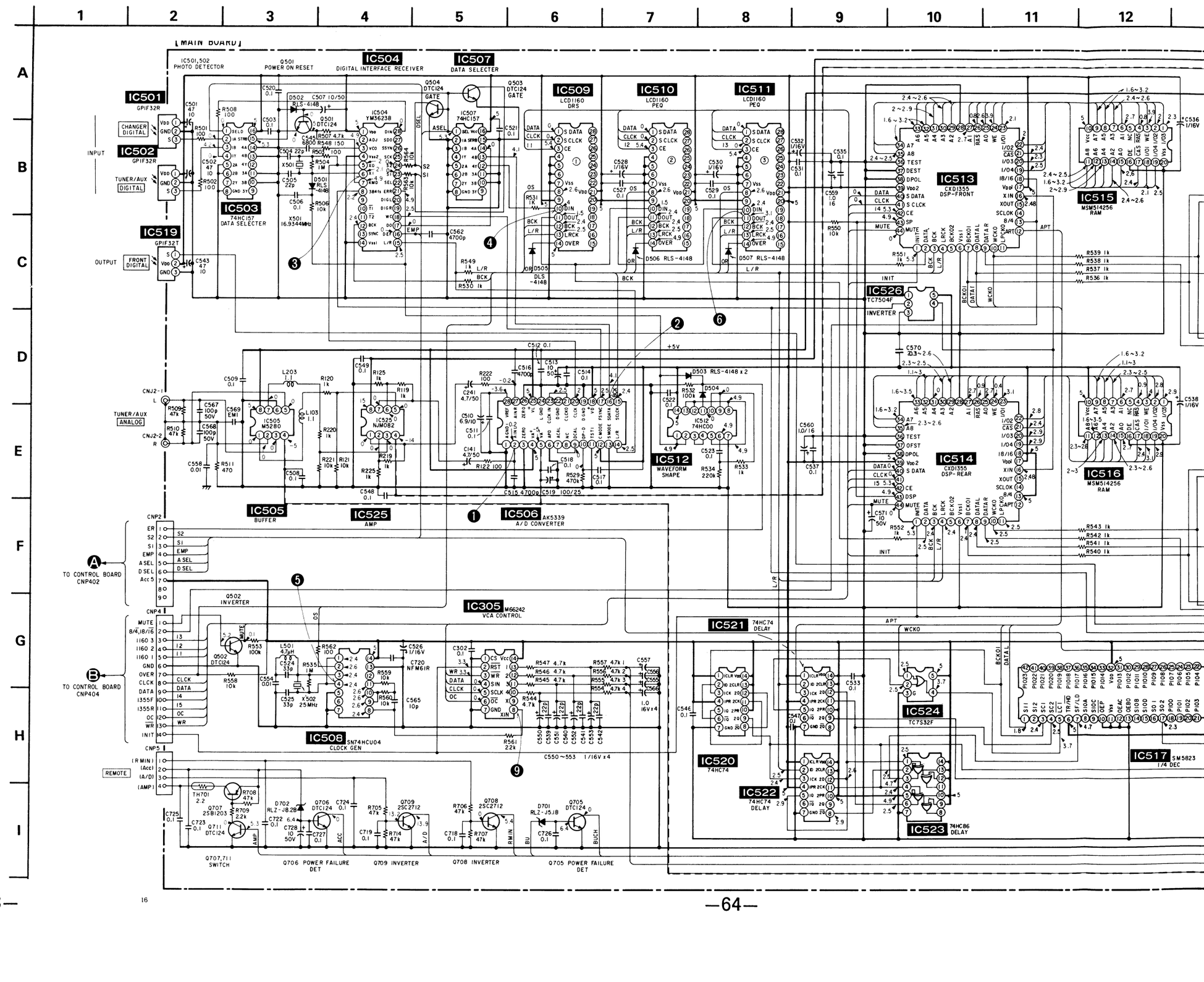




Note on Schematic Diagram:

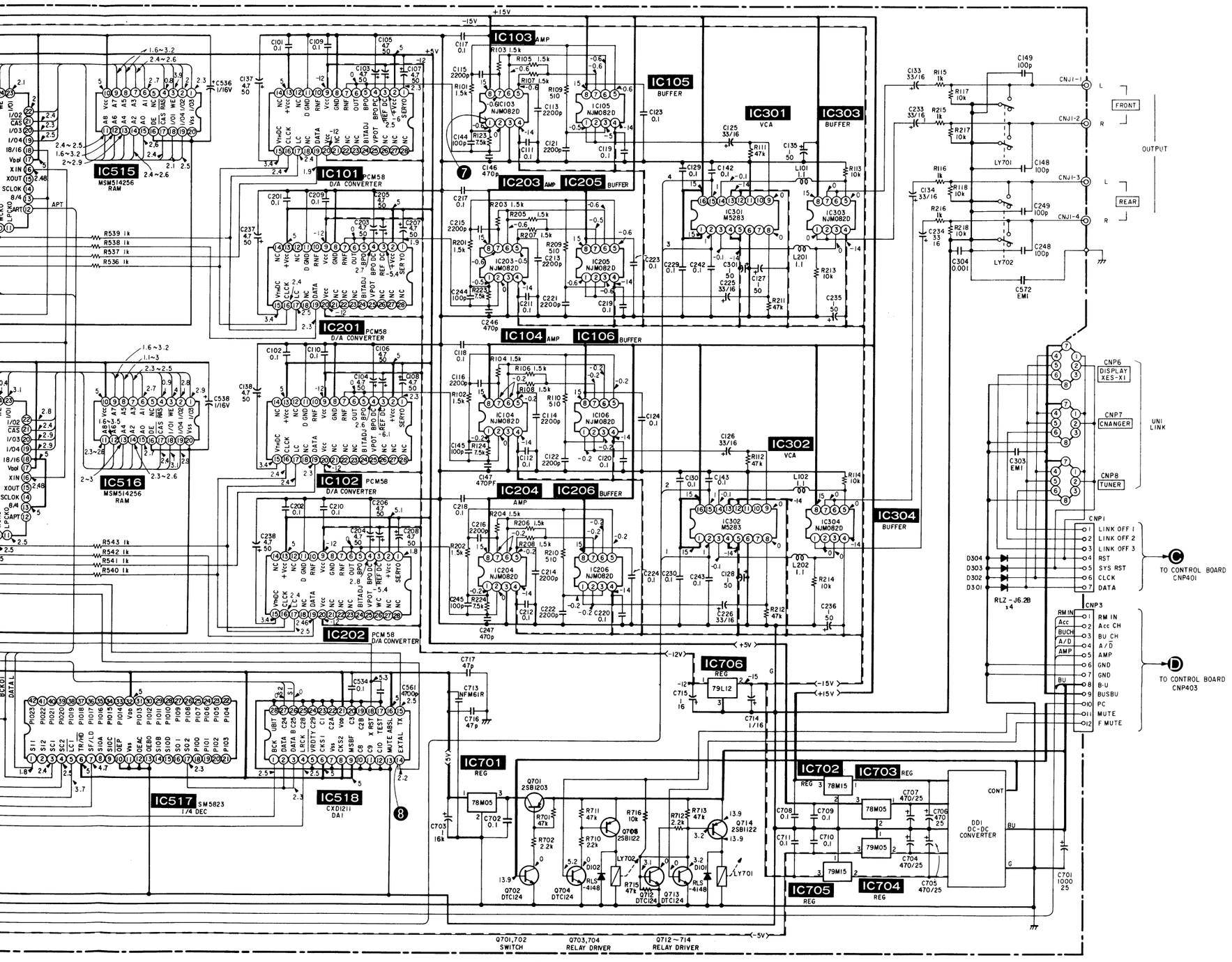
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- ——— : B+ Line
- ▬▬ : B– Line
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

2-3. SCHEMATIC DIAGRAM – MAIN SECTION – •See page 81 for Waveform. •See page 82 for IC Block Diagrams.

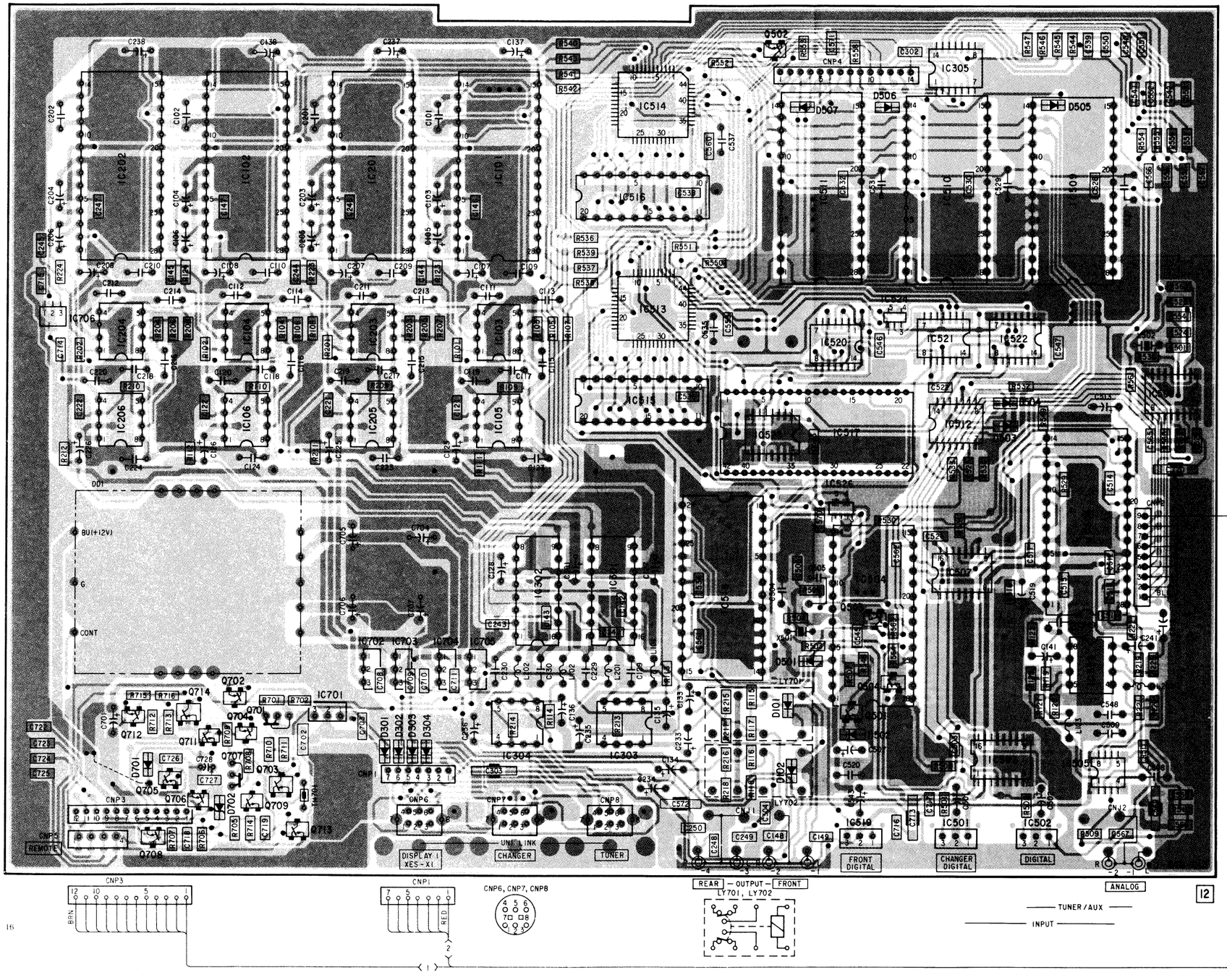


Note on Schematic Diagram:

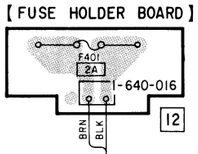
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- ——— : B+ Line
- ▬▬▬ : B– Line
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.


IC515 MSM514256 RAM
IC516 MSM514256 RAM
IC517 SM5823 1/4 DEC
IC518 CXD1211 DAI
IC101 PCM58 D/A CONVERTER
IC102 PCM58 D/A CONVERTER
IC201 PCM58 D/A CONVERTER
IC202 PCM58 D/A CONVERTER
IC103 AMP
IC104 AMP
IC203 AMP
IC204 AMP
IC105 BUFFER
IC106 BUFFER
IC205 BUFFER
IC206 BUFFER
IC301 VCA
IC302 VCA
IC303 BUFFER
IC304 BUFFER
IC706 REG 79L12
IC701 REG 78M05
IC702 REG 78M15
IC703 REG 78M05
IC704 REG 79M15
IC705 REG 79M05
DDI DC-DC CONVERTER
CNJI-1 L FRONT
CNJI-2 R FRONT
CNJI-3 L REAR
CNJI-4 R REAR
OUTPUT
CNP6 DISPLAY XES-X1
CNP7 CNANGER
CNP8 TUNER
UNI LINK
CNP1 LINK OFF 1 / LINK OFF 2 / LINK OFF 3 / RST / SYS RST / CLCK / DATA
TO CONTROL BOARD CNP401
CNP3 RM IN / Acc CH / BU CH / A/D / AMP / GND / GND / B-U / BUSBU / PC / MUTE / F MUTE
TO CONTROL BOARD CNP403
D301 D302 D303 D304 RLZ-J6.2B x4
LY701 LY702
Q701,702 SWITCH
Q703,704 RELAY DRIVER
Q712~714 RELAY DRIVER

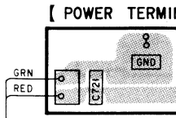
【MAIN BOARD】



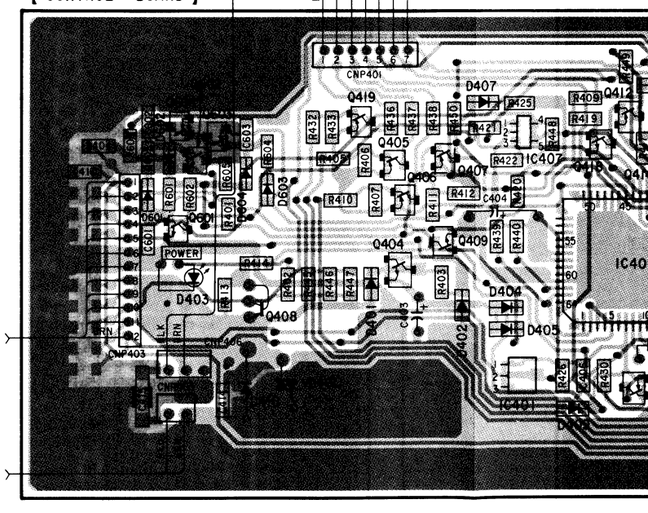
【FUSE HOLDER BOARD】

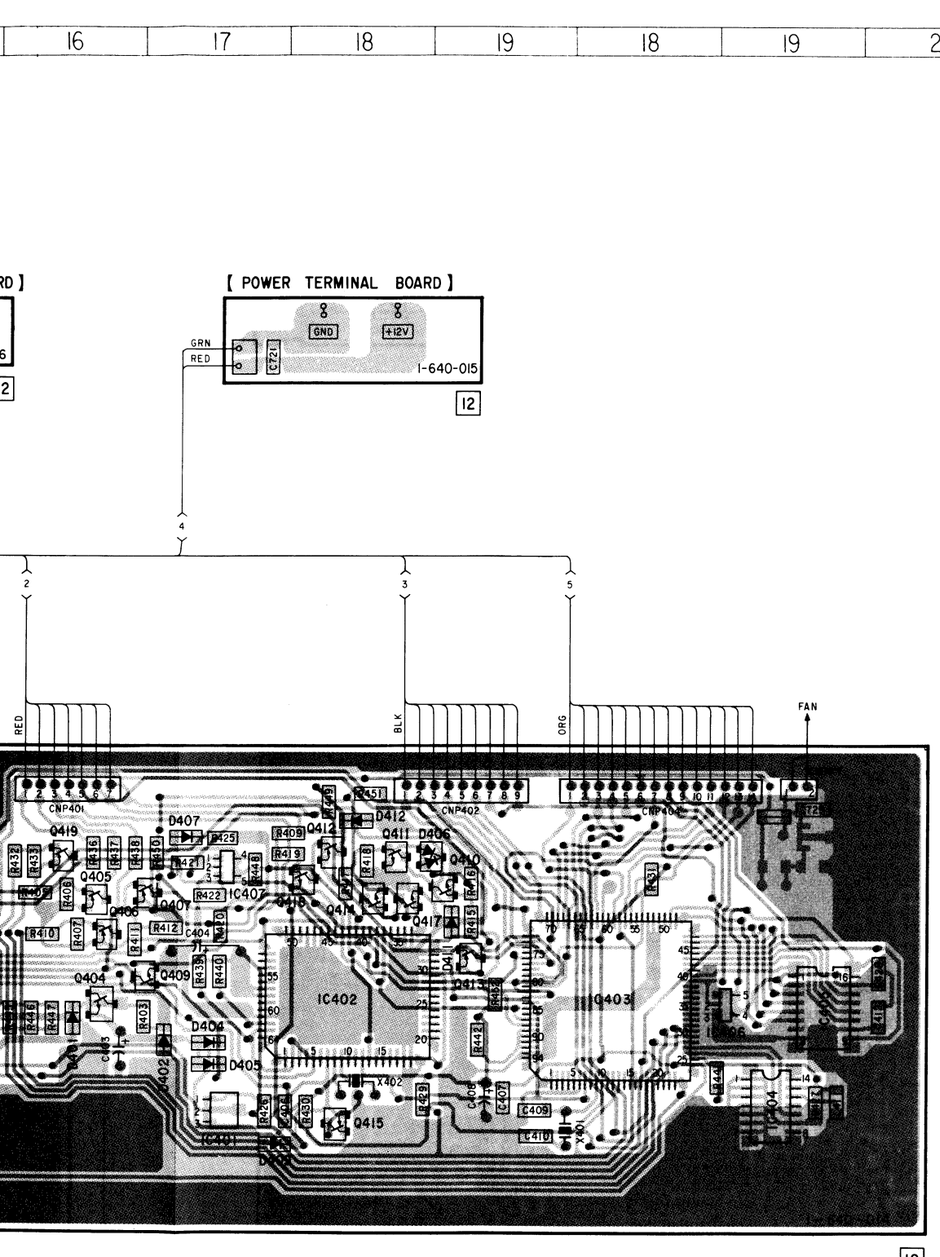


【POWER TERMI



【CONTROL BOARD】





· Semiconductor Location

Ref. No.	Location	Ref. No.	Location
D101	G-8	IC508	D-12
D102	H-8	IC509	C-11
D301	H-4	IC510	B-10
D302	H-4	IC511	B-8
D303	H-5	IC512	E-10
D304	H-5	IC513	D-7
D401	G-16	IC514	B-7
D402	G-17	IC515	E-7
D403	G-15	IC516	C-7
D404	G-17	IC517	E-8
D405	G-17	IC518	F-8
D406	F-18	IC519	I-9
D407	F-17	IC520	D-9
D409	H-17	IC521	D-10
D410	H-15	IC522	D-10
D411	G-19	IC523	E-8
D412	F-18	IC524	D-9
D501	G-8	IC525	G-11
D502	H-9	IC526	F-9
D503	E-10	IC701	G-4
D504	E-10	IC702	G-4
D505	B-11	IC703	G-5
D506	B-9	IC704	G-5
D507	B-8	IC705	G-5
D601	G-15	IC706	D-1
D602	F-15		
D603	G-15	Q404	G-16
D604	F-15	Q405	F-16
D701	H-2	Q406	G-16
D702	H-3	Q407	F-17
		Q408	G-15
IC101	B-5	Q409	G-17
IC102	B-3	Q410	F-19
IC103	D-5	Q411	F-18
IC104	D-3	Q412	F-18
IC105	E-5	Q413	G-19
IC106	E-3	Q414	F-18
IC201	B-4	Q415	H-18
IC202	B-2	Q417	F-18
IC203	D-4	Q418	F-18
IC204	D-2	Q419	F-16
IC205	E-4	Q501	G-9
IC206	E-2	Q502	A-8
IC301	F-7	Q503	G-9
IC302	F-6	Q504	G-9
IC303	H-7	Q601	G-15
IC304	H-6	Q602	F-15
IC305	A-10	Q603	F-15
IC401	H-17	Q604	F-15
IC402	G-18	Q701	H-3
IC403	G-20	Q702	G-3
IC404	H-21	Q703	H-3
IC405	G-21	Q704	H-3
IC406	G-21	Q705	H-2
IC407	F-17	Q706	H-3
IC501	I-10	Q707	H-3
IC502	I-11	Q708	I-2
IC503	H-10	Q709	H-3
IC504	F-9	Q711	H-3
IC505	H-11	Q712	H-2
IC506	F-11	Q713	I-4
IC507	F-10	Q714	H-3

Note on Mounting Diagram :

- ○—— : Parts extracted from the component side.
- ● : Through hole.
- ▩ : Pattern on the side which is seen.
- ▨ : Pattern of the rear side.

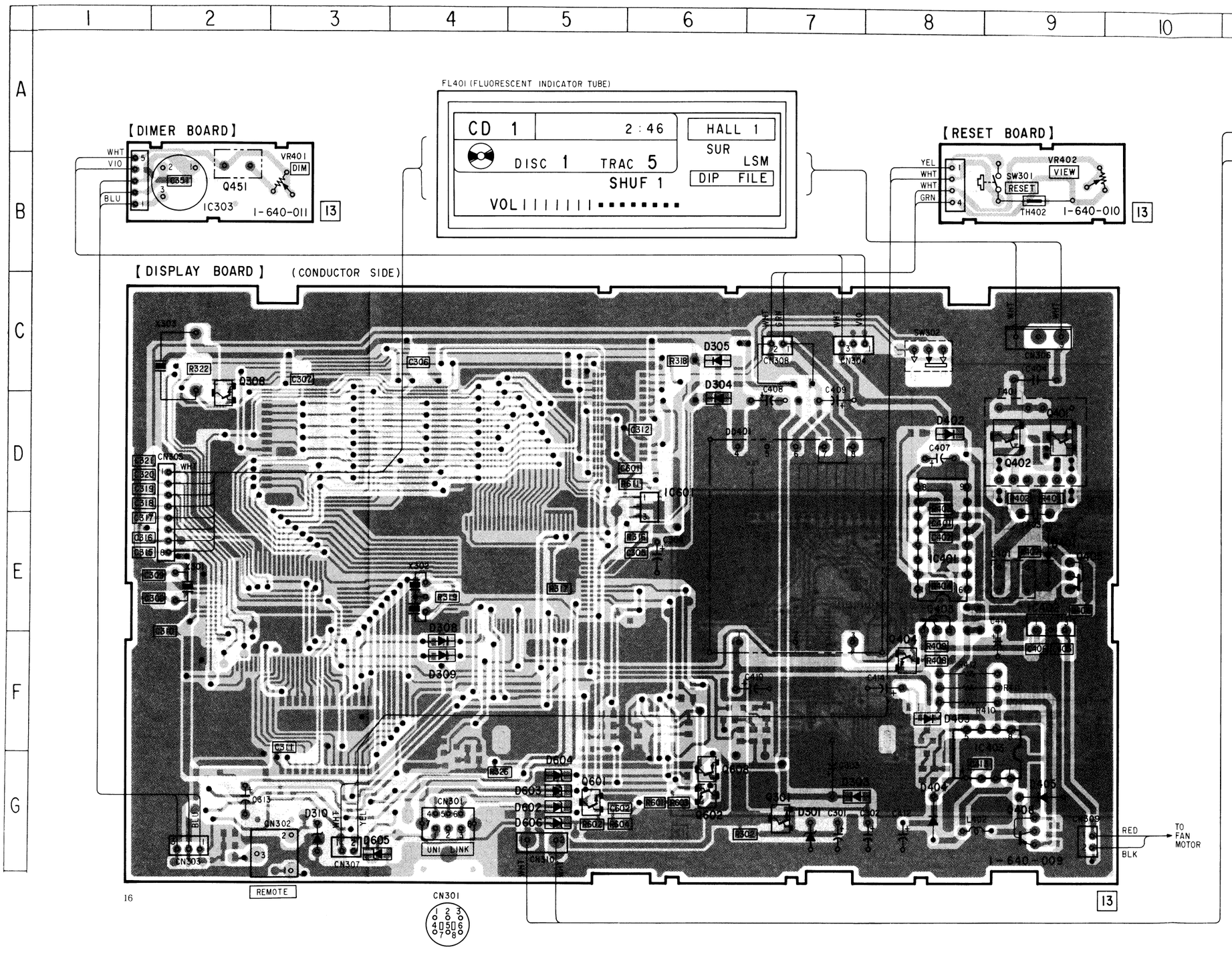
• Semiconductor Location

Ref. No.	Location
D301	G-7
D302	F-14
D303	G-7
D304	D-6
D305	C-6
D306	G-17
D307	E-15
D308	F-4
D309	F-4
D310	G-3
D401	E-9
D402	D-8
D403	F-8
D404	G-8
D405	G-9
D601	F-15
D602	G-5
D603	G-5
D604	G-5
D605	G-3
D606	G-5
IC302	E-16
IC303	B-2
IC304	D-17
IC305	D-18
IC306	D-15
IC307	D-15
IC308	E-18
IC309	F-17
IC401	E-8
IC402	E-9
IC403	G-8
IC601	D-6
IC602	F-14
Q301	G-7
Q302	F-14
Q303	G-17
Q304	G-18
Q305	G-18
Q306	F-16
Q307	G-18
Q308	D-2
Q309	G-16
Q310	F-14
Q311	G-18
Q401	D-9
Q402	D-9
Q403	E-8
Q404	F-8
Q405	E-9
Q407	F-12
Q408	G-9
Q409	F-12
Q451	B-2
Q601	G-5
Q602	G-6
Q603	F-15
Q608	G-6

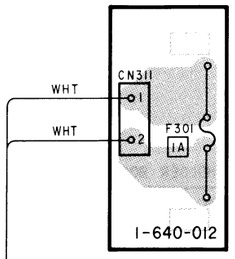
Note on Mounting Diagram:

- ○—— : parts extracted from the component side.
- ● : Through hole.
- ▒▒ : Pattern on the side which is seen.
- ▒▒ : Pattern of the rear side.

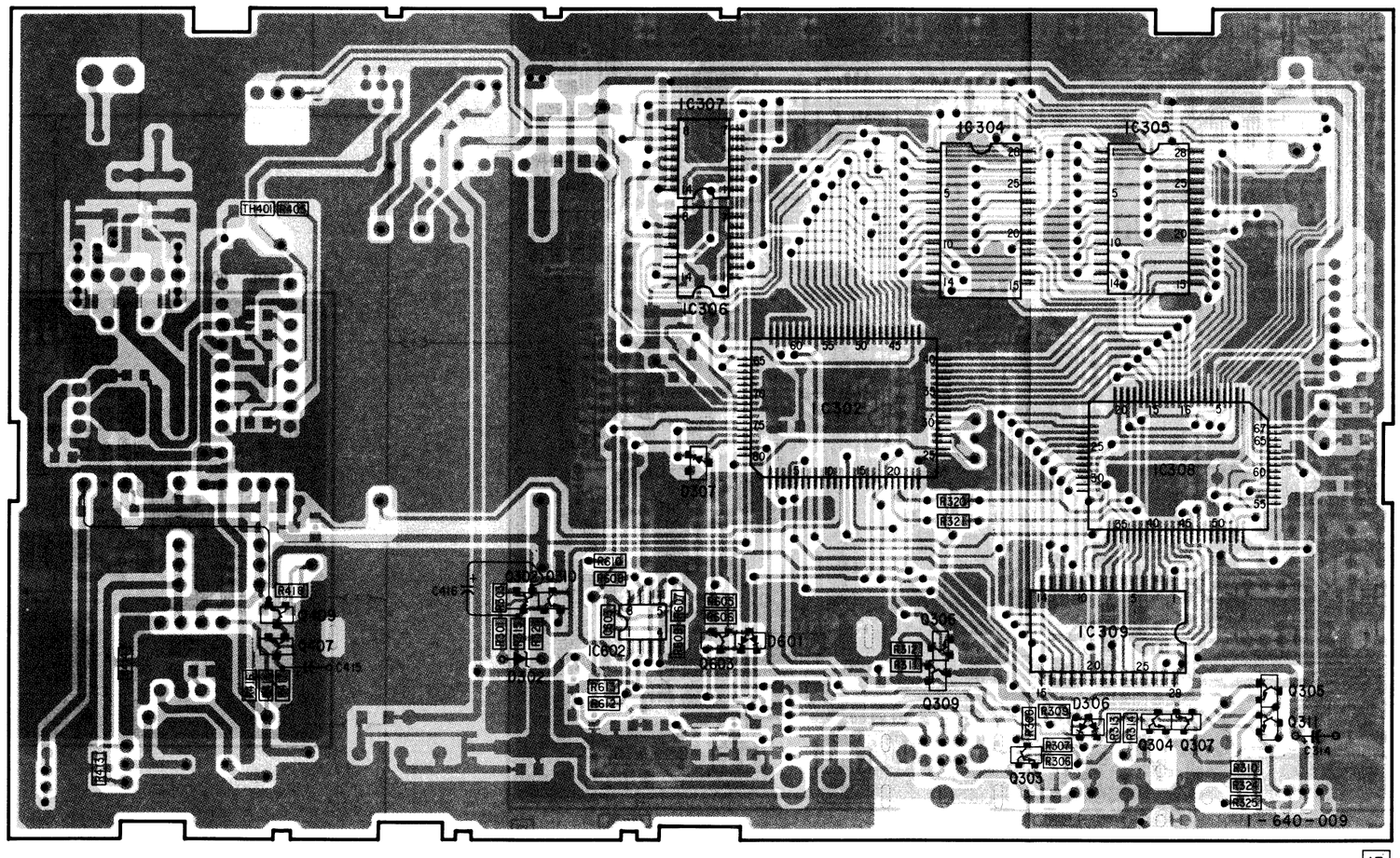
2-5. PRINTED WIRING BOARD – DISPLAY SECTION – • See page 79 for Circuit Board Location . •See page 80 for Semiconductor Lead Layouts.

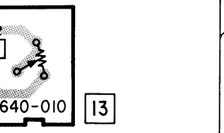


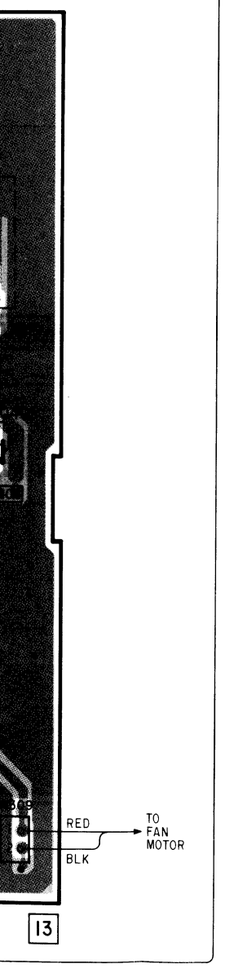
【DISPLAY FUSE HOLDER BOARD】



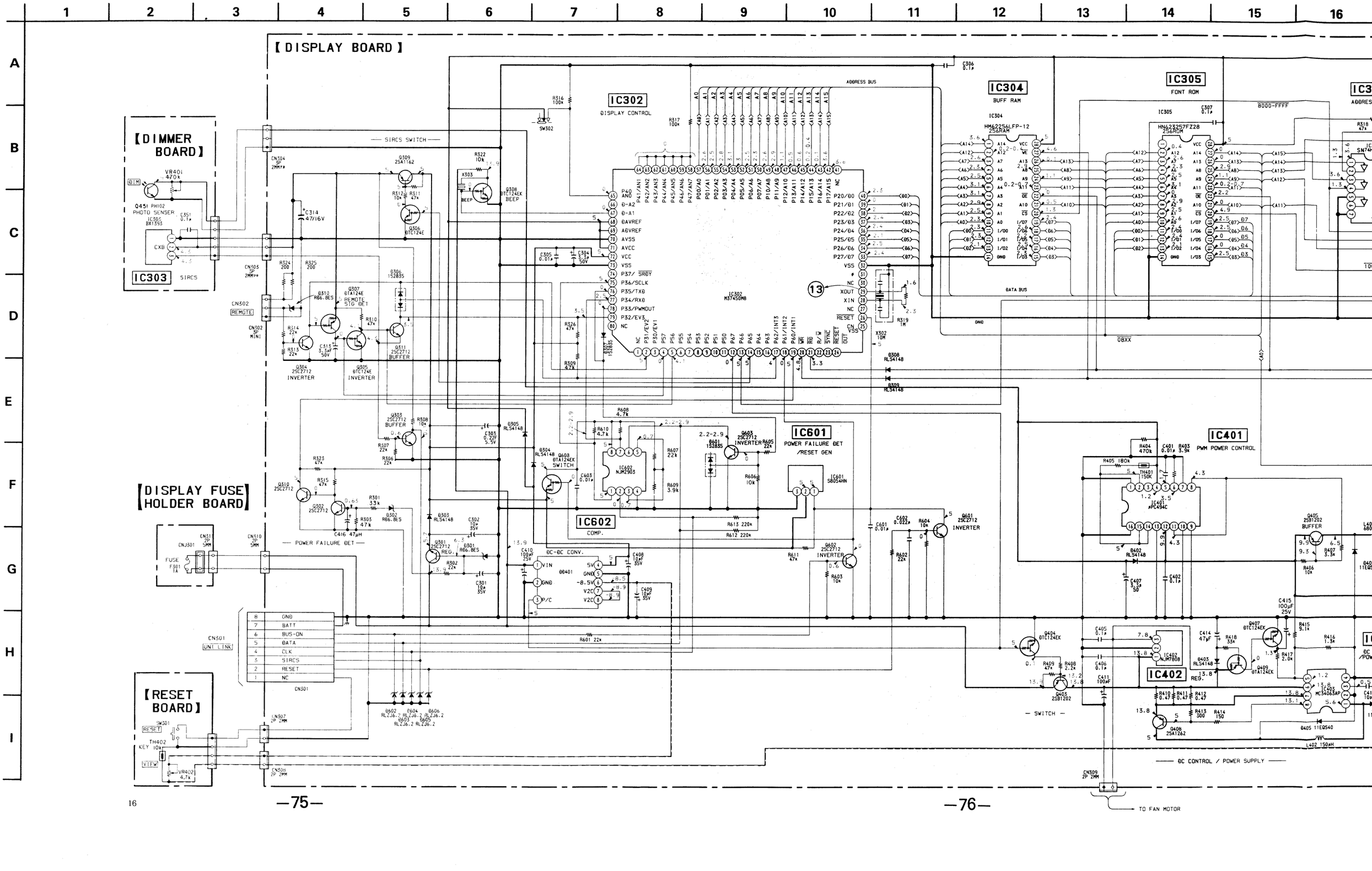
【 DISPLAY BOARD 】 (COMPONENT SIDE)

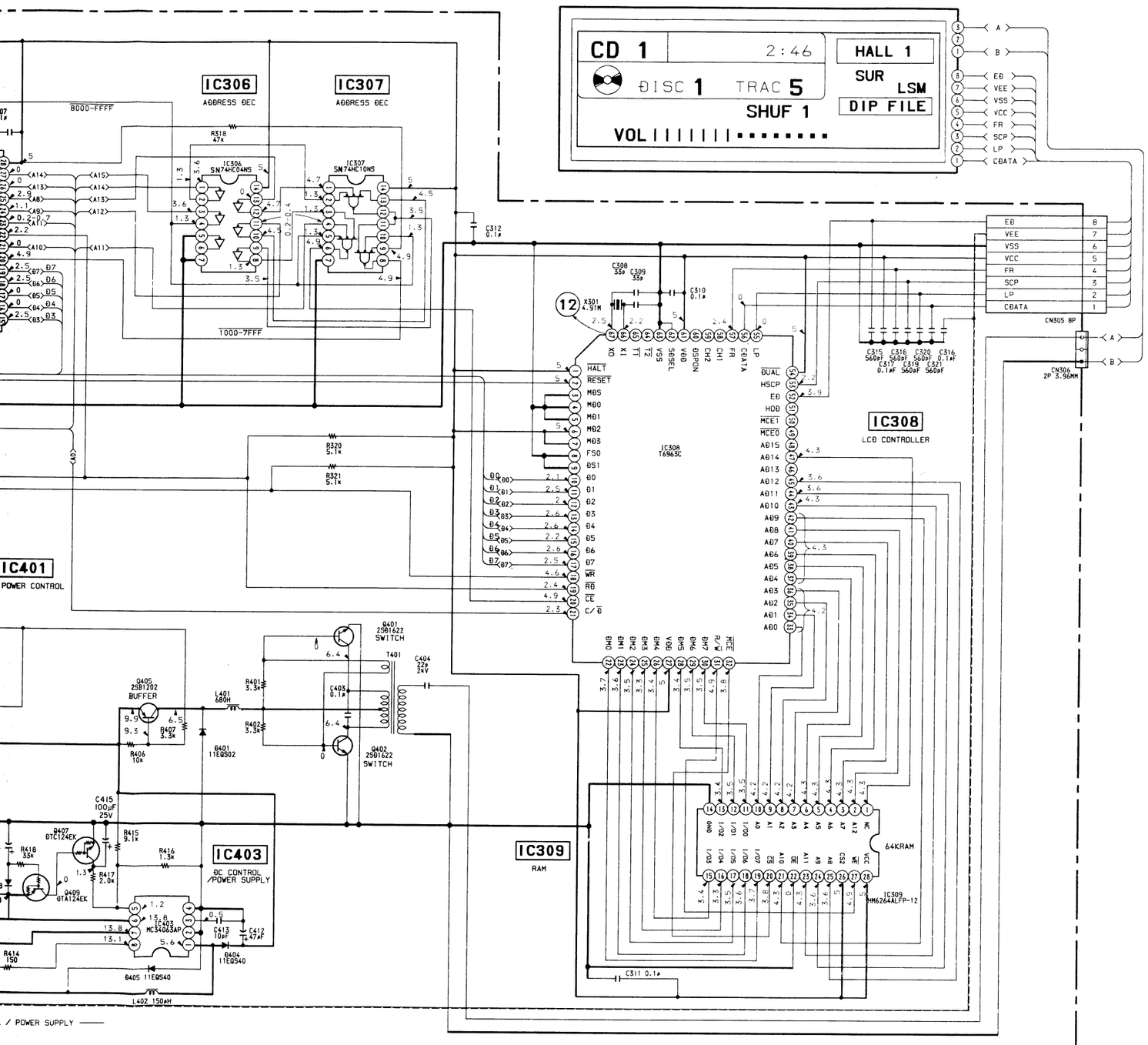






2-6. SCHEMATIC DIAGRAM – DISPLAY SECTION – •See page 81 for Wavefrom. •See page 82 for IC Block Diagrams.



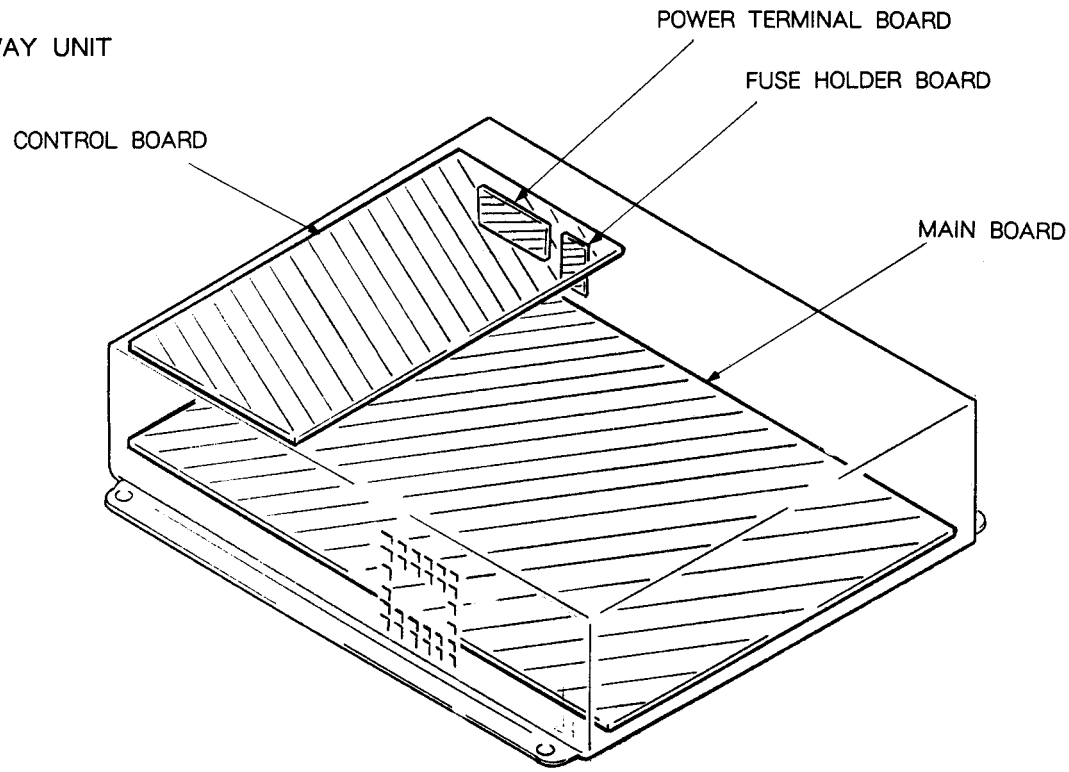


Note on Schematic Diagram:

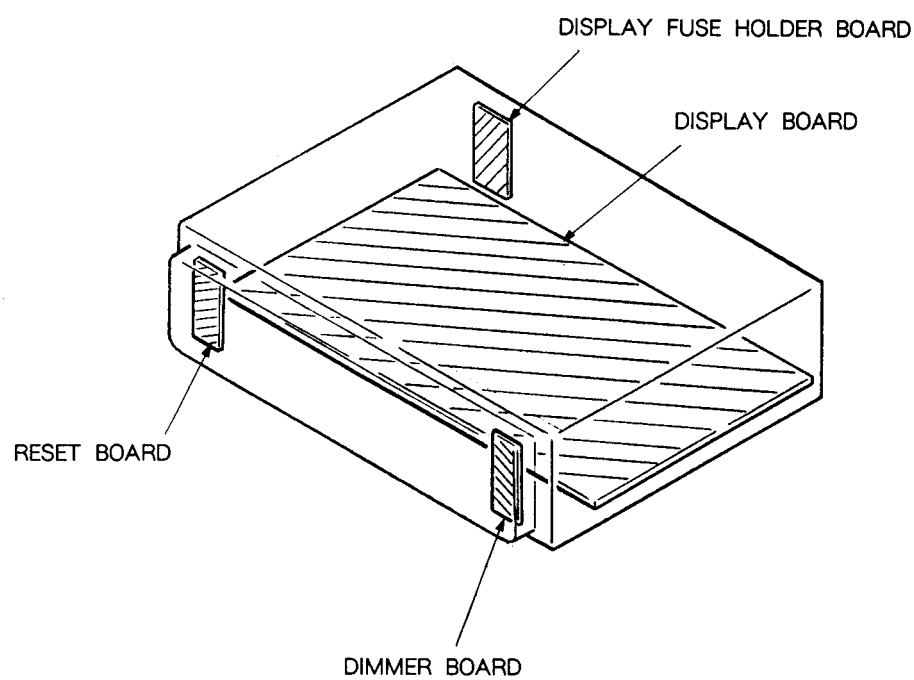
- All capacitors are in μF unless otherwise noted. pF: μμF 50WV or less are not indicated except for electrolytics and tantalums.
- All resistors are in Ω and ¼W or less unless otherwise specified.
- ——— : B+ Line
- ▬ ▬ ▬ : B– Line
- Voltage and waveforms are dc with respect to ground under no-signal (detuned) conditions.
- Voltages are taken with a VOM (input impedance 10 MΩ). Voltage variations may be noted due to normal production tolerances.
- Waveforms are taken with a oscilloscope. Voltage variations may be noted due to normal production tolerances.
- Circled numbers refer to waveforms.

2-7. CIRCUIT BOARD LOCATION

• HIDEAWAY UNIT

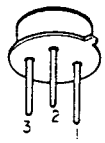


• DISPLAY UNIT

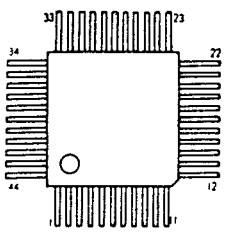


2-8. SEMICONDUCTOR LEAD LAYOUT

BX-1393

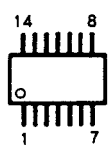


CXD1355AQ



MC74HC74AF

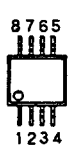
M66242FP



(TOP VIEW)

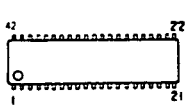
M5280FP

NJM2903



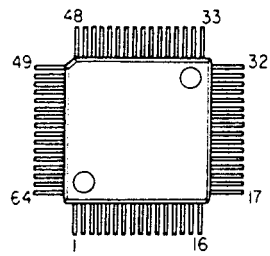
(TOP VIEW)

SM5823AP

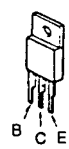


(TOP VIEW)

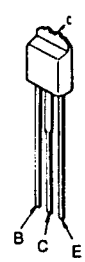
μPD75116-GF-E22-3BE



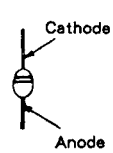
2SA1262



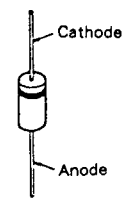
2SB1203T



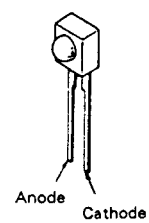
DSA3A4



HZ6A2L



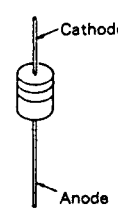
LN35GCP



RD6.2ES-B2

RD6.8ES1B2

11EQSD4

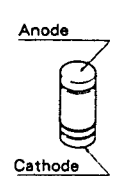


RLS-4148

RLZ-J6.2B

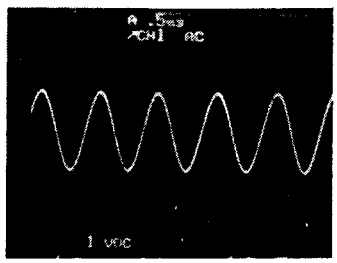
RLZ-J7.5B

RLZ-J8.2B



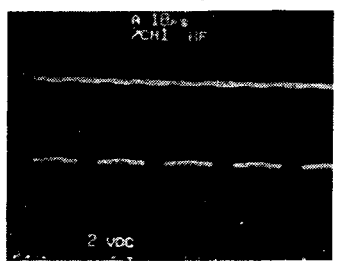
2-9. WAVEFORM

❶ IC506 ② Pin



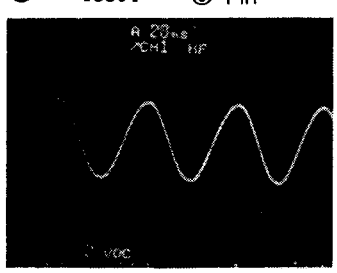
2.8Vp-p 10mS

❷ IC506 ⑯ Pin



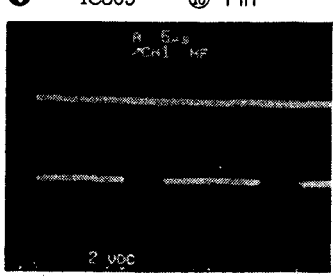
6Vp-p 20 μS

❸ IC504 ⑥ Pin



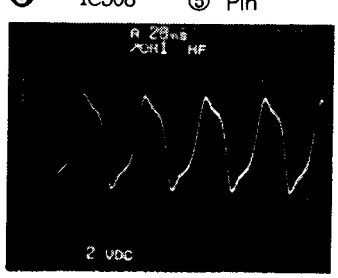
5.5Vp-p 60nS

❹ IC509 ⑩ Pin



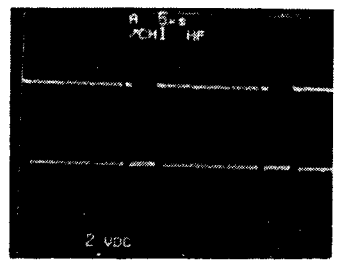
6Vp-p 23 μS

❺ IC508 ⑤ Pin



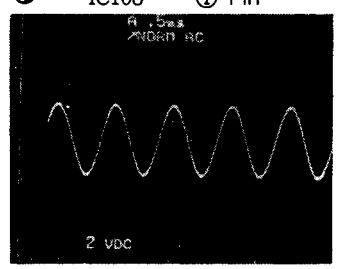
6Vp-p 40nS

❻ IC511 ⑪ Pin



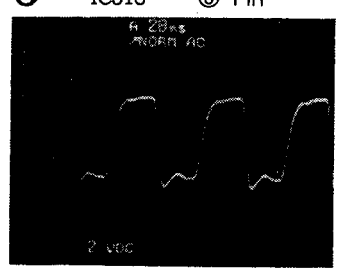
3.6Vp-p 23 μSec

❼ IC103 ① Pin



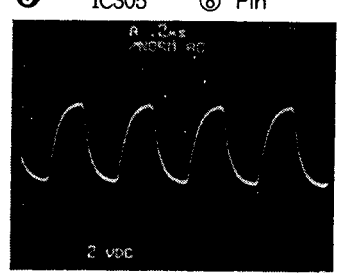
5Vp-p 150 μSec

❽ IC518 ⑧ Pin



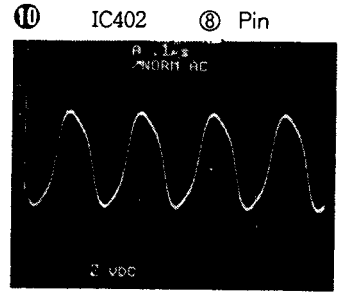
5Vp-p 60nSec

❾ IC305 ⑧ Pin



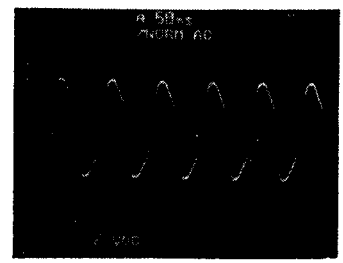
4.8Vp-p 480nSec

❿ IC402 ⑧ Pin



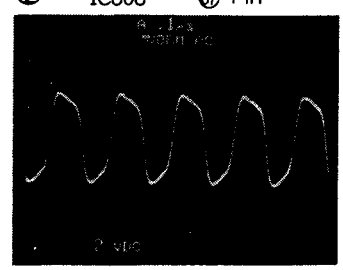
6.4Vp-p 240nSec

⓫ IC404 ⑨ Pin



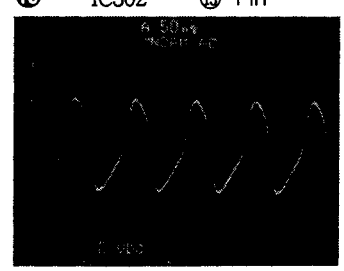
6.4Vp-p 85nSec

⓬ IC308 ⑰ Pin



6Vp-p 200nSec

⓭ IC302 ⑬ Pin

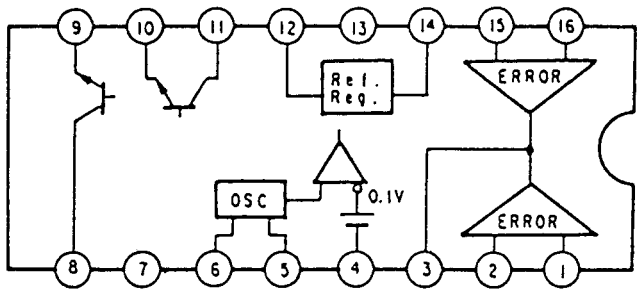


6.4Vp-p 100nSec

2-10. IC BLOCK DIAGRAMS

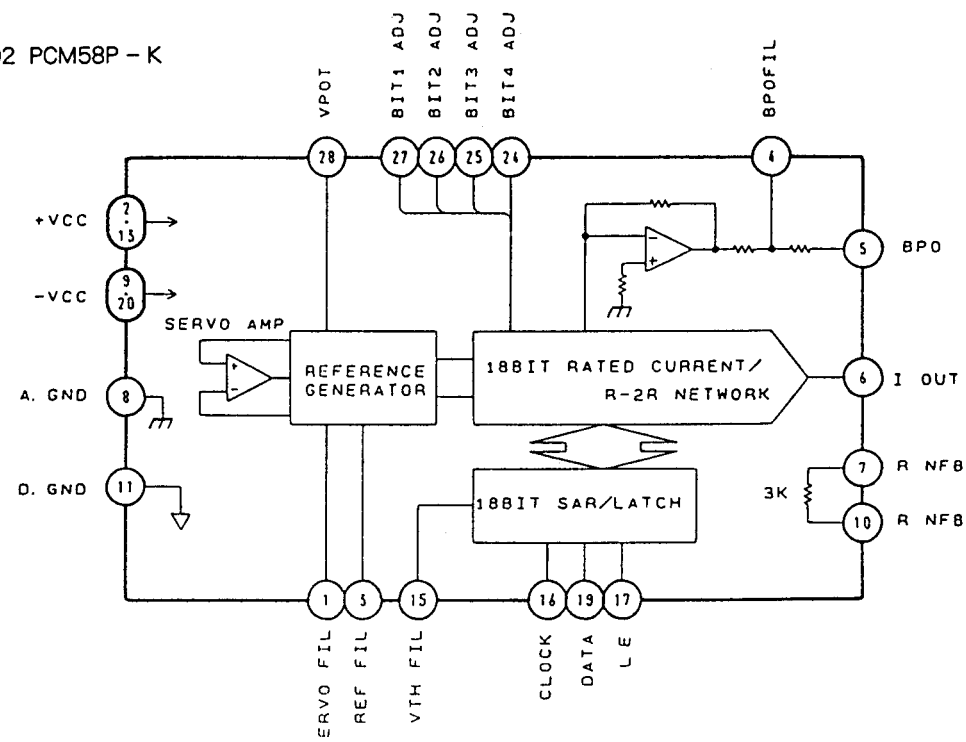
● DISPLAY BOARD

• IC401 μ PC494C

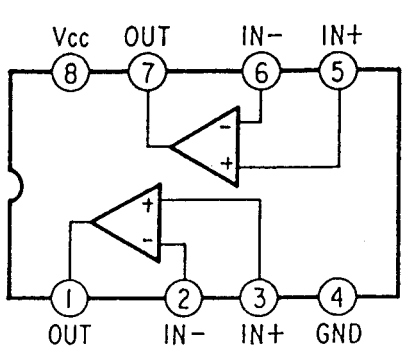


● MAIN BOARD

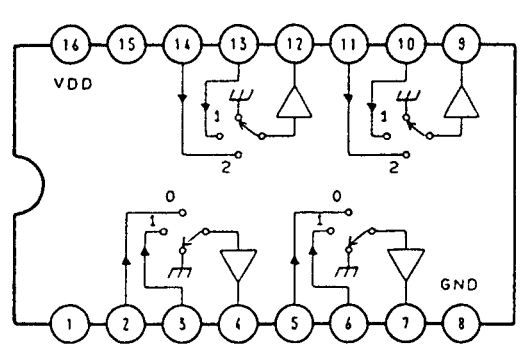
• IC101,102,201,202 PCM58P - K



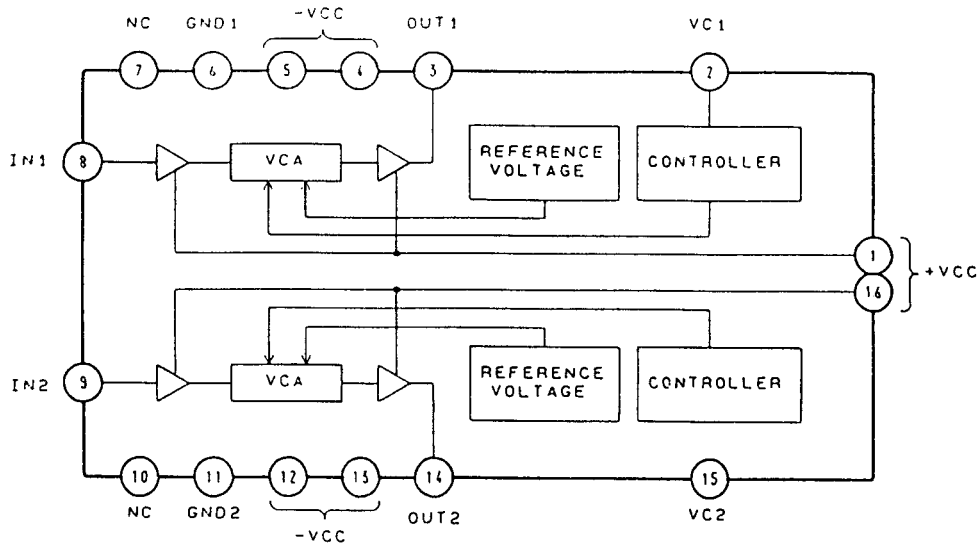
• IC103 - 106,203 - 206,303,304,525 TL082CP



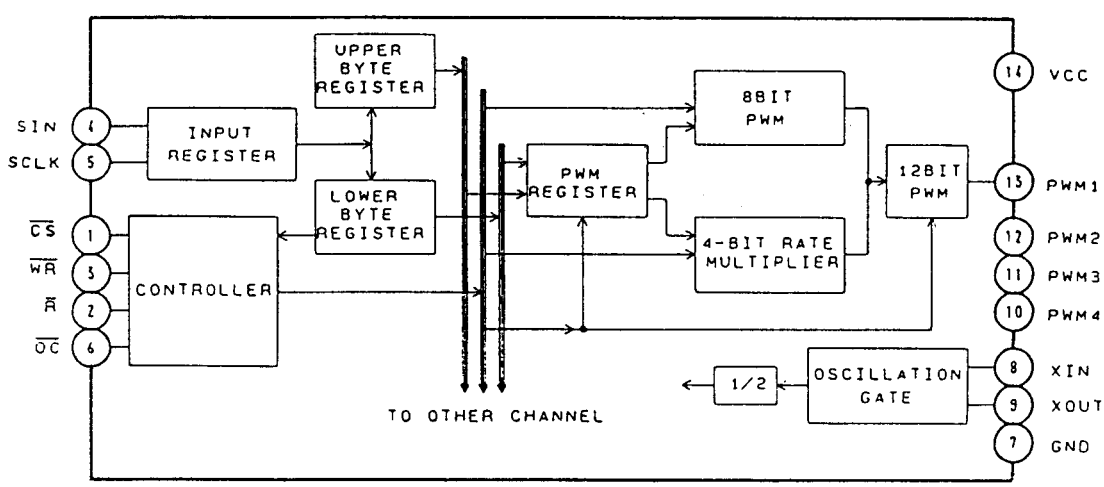
• IC503,507 SN74HC157NS



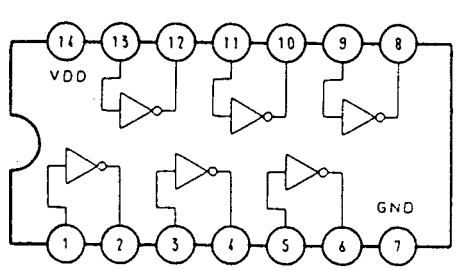
· IC301,302 M5283P



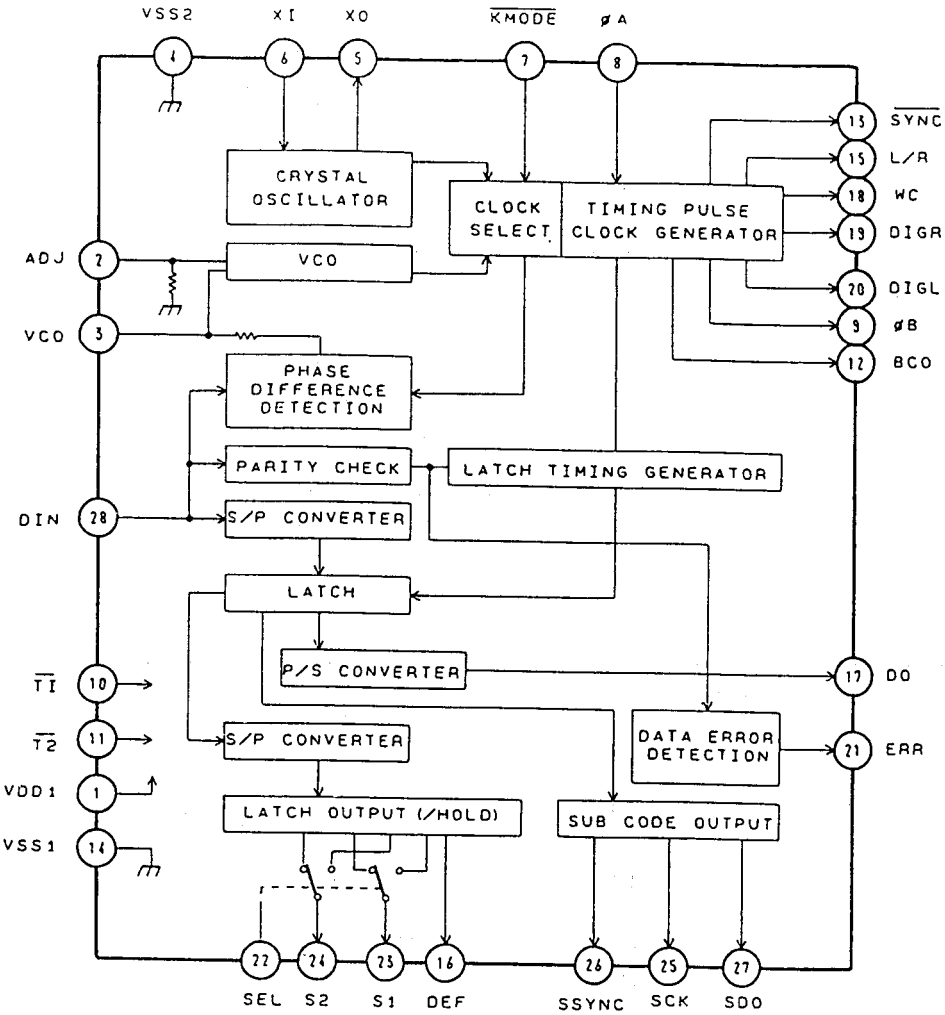
· IC305 M66242FP



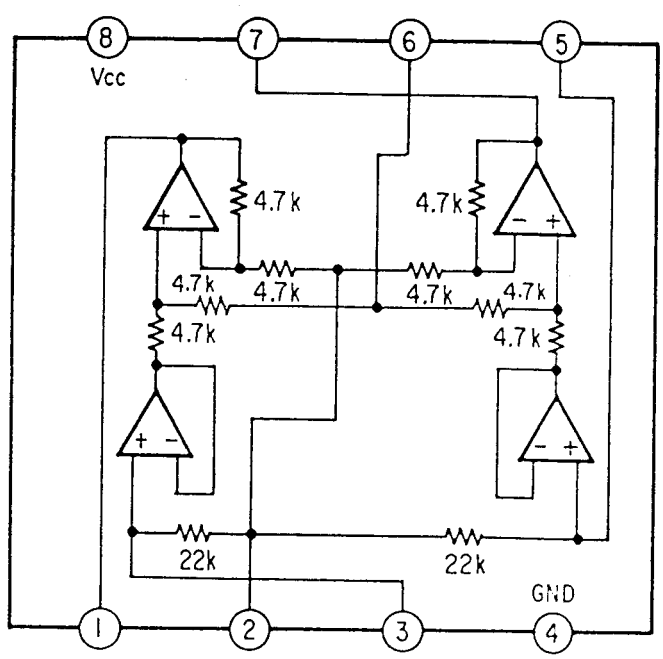
· IC508 TC74HCU04AF



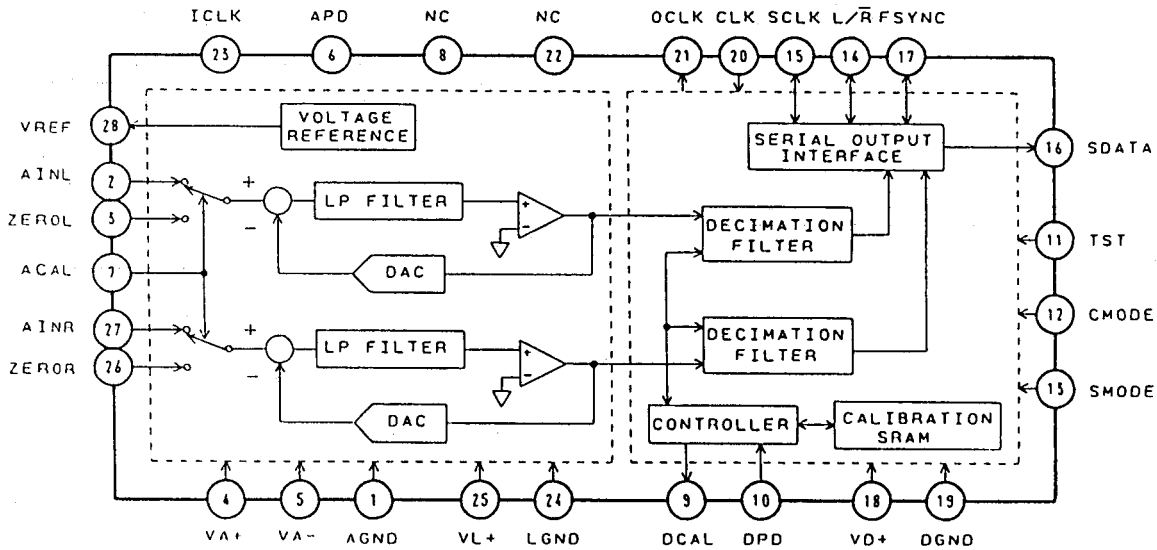
· IC504 YM3623B



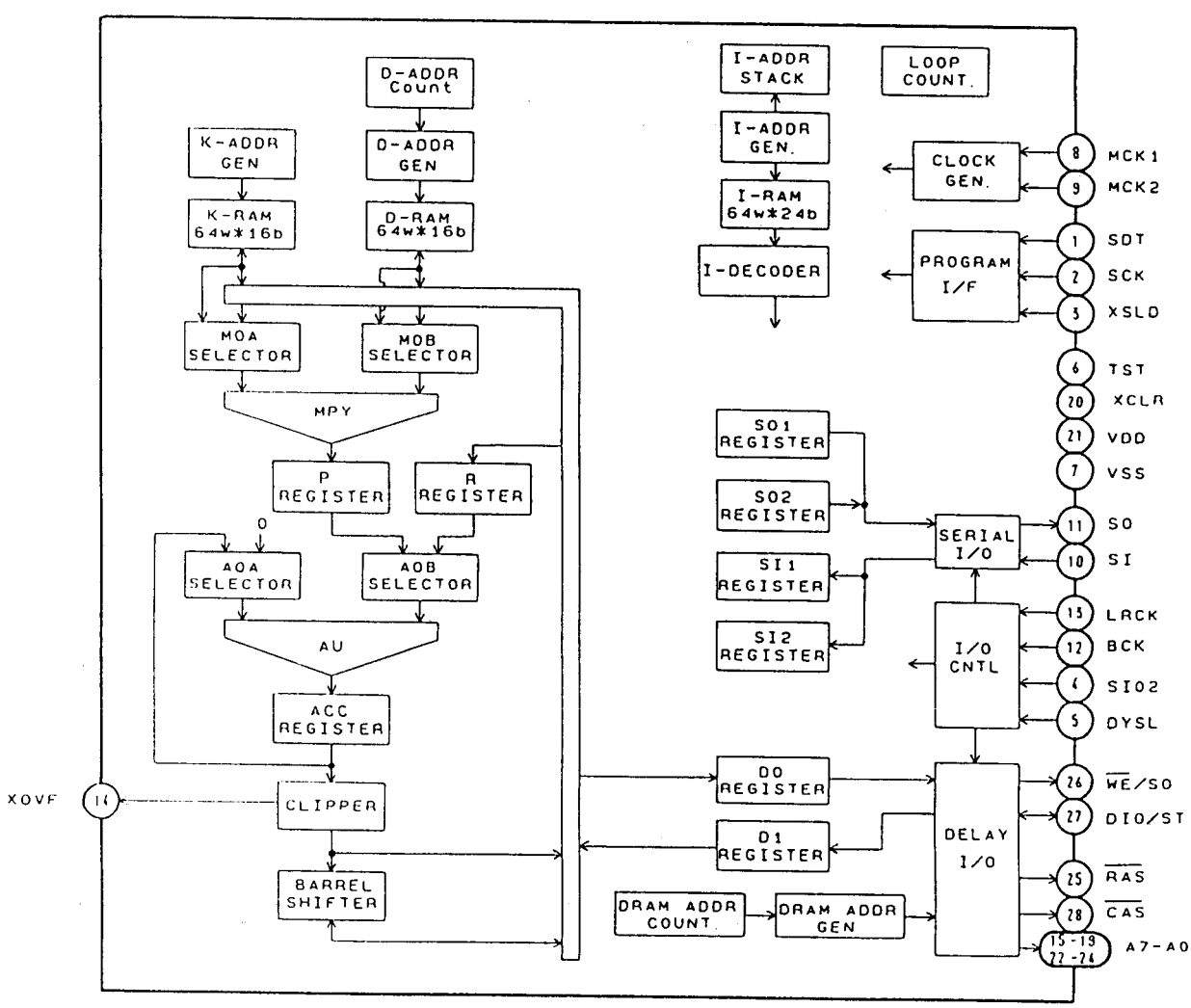
· IC505 M5280FP



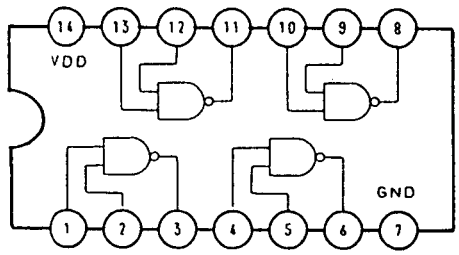
• IC506 AK5339



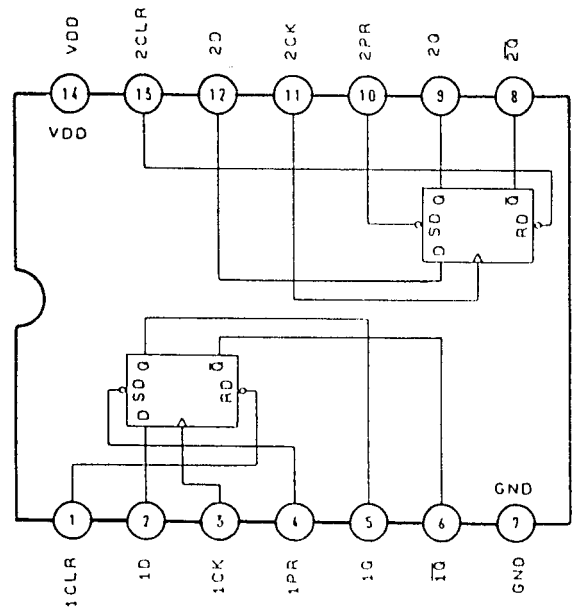
• IC509,510,511 CXD1160AP



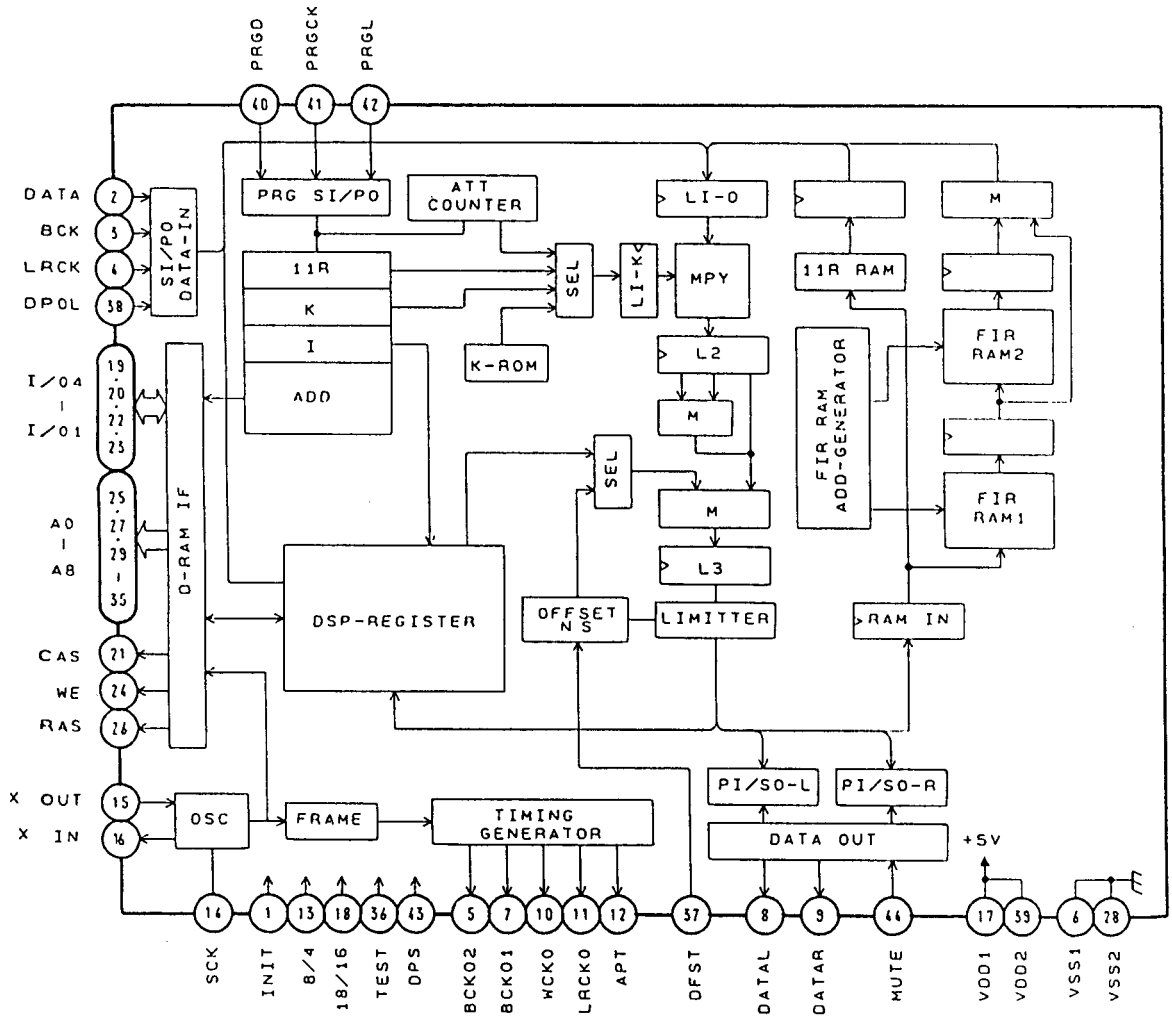
• IC512 MC74HC00AF



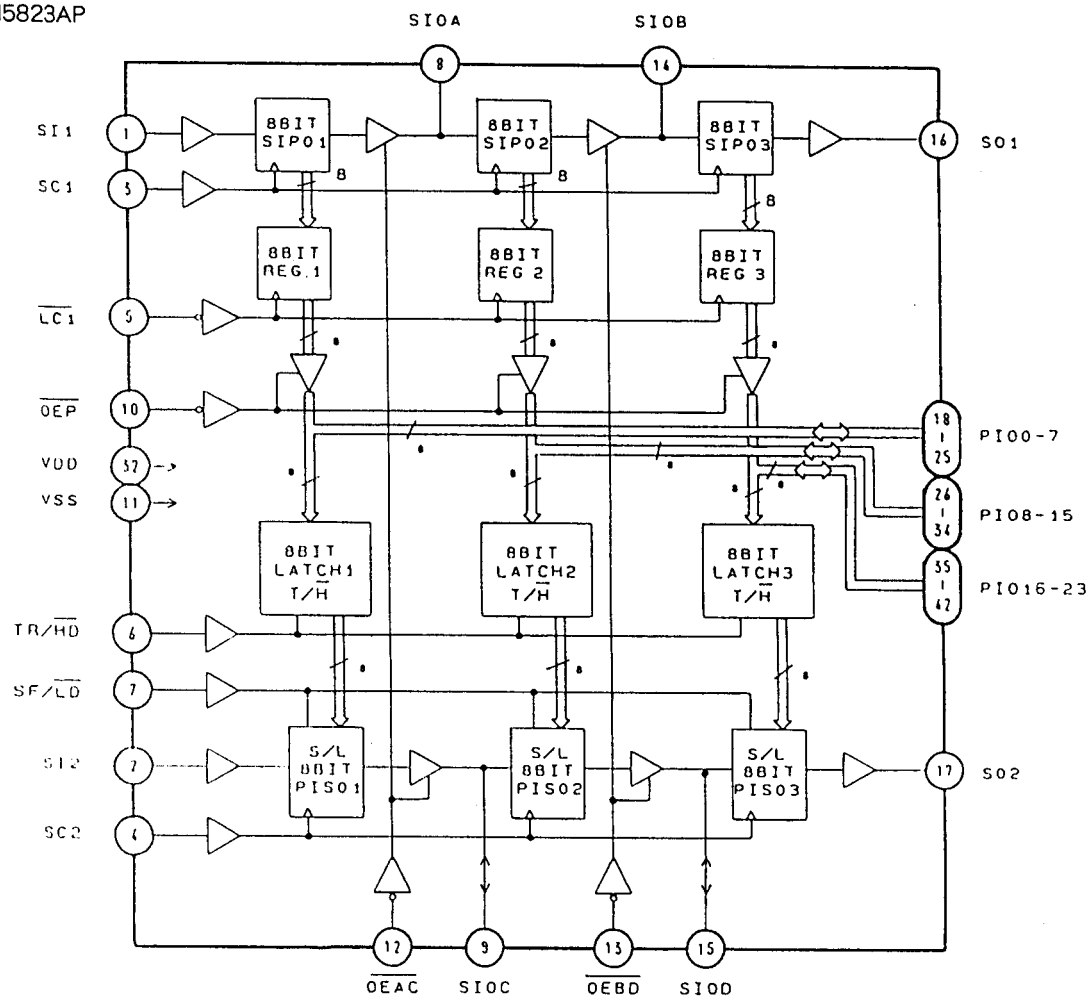
• IC520 – 522 MC74HC74AF



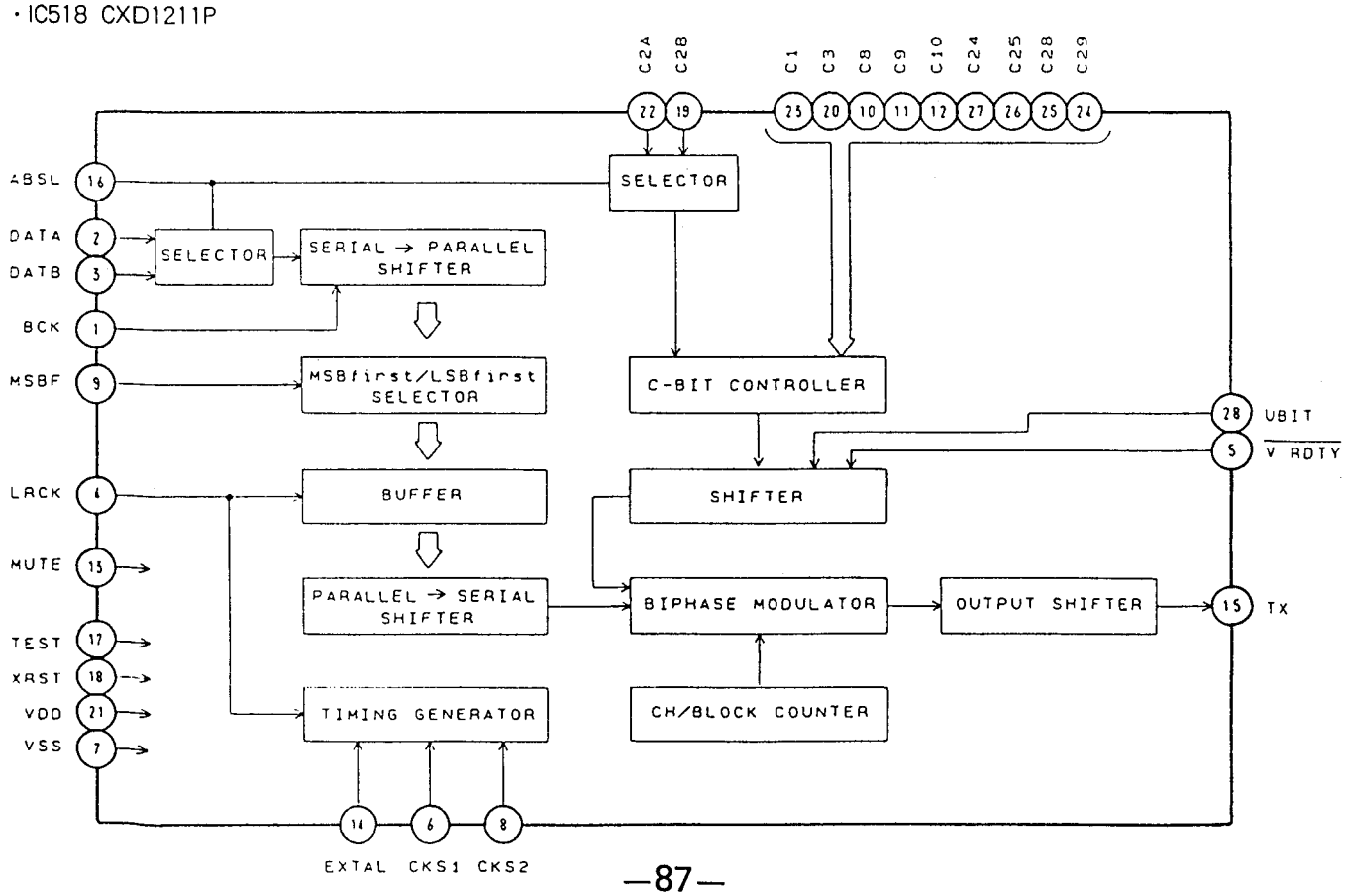
• IC513,514 CXD1355Q



• IC517 SM5823AP



• IC518 CXD1211P



2-11. IC PIN DESCRIPTION

IC302 DISPLAY CONTROL MICRO-COMPUTER (M37450) PIN FUNCTIONS (DISPLAY BOARD)

Pin No.	Pin Name	I/O	Function
1			NOT USED
2	EV2	I	REMOTE CONTROLLER INPUT
3			NOT USED
4,5			NEGLECTED BY PROGRAM
6~11			NOT USED
12	POWER ON	O	POWER ON/$\overline{OFF}$
13	LCD $\overline{RESET}$	O	LCD CONTROLLER RESET
14	SIRCS ON	O	SIRCS/REMOTE POWER ON
15,16			NOT USED
17	INT3		NEGLECTED
18	INT2	I	BUS-ON INPUT (FOR UNILINK)
19	INT1	I	POWER FAILURE DET
20	$\overline{WR}$	O	$\overline{WRITE}$ COMMAND
21	$\overline{RD}$	O	$\overline{READ}$ COMMAND
22~25			NOT USED
26	$\overline{RESET}$	I	
27			NOT USED
28,29	X IN/OUT		
30,31			NOT USED
32	VSS		
33~40	D0~D7	I/O	DATA BUS
41			NOT USED
42~57	A0~A15	O	ADDRESS BUS
58~64			NOT USED
65	REMOTE SELECT	O	JOY STICK AMS/VOL DIR SELECT
66			NOT USED
67	BEEP	O	BEEP SOUND OUTPUT
68,69	DA/AD VREF		
70	AVSS		
71	AVCC		
72	VCC		
73	VSS		
74			NOT USED
75	SCLK	I	CLOCK IN (FOP UNILINK)
76	TXD	O	DATA OUT (FOP UNILINK)
77	RXD	I	DATA IN (FOP UNILINK)
78	PWMOUT	O	REQ (FOP UNILINK)
79	EV3	I	
80			NOT USED

IC402 MASTER MICRO-COMPUTER (μPD75116) PIN FUNCTIONS (CONTROL BOARD)

Pin No.	Pin Name	I/O	Function
1~4			NOT USED
5	POW ON	O	POWER ON (REMOTE)
6	ACC ON	O	NOT USED
7	$\overline{\text{RST}}$	I	RESET
8	X2	I	X'TAL IN
9	X1	I	X'TAL IN
10,11			NOT USED
12	SYS RST	O	SYSTEM RESET (FOR UNILINK)
13	SYNC	O	SYNC (FOR UNILINK)
14~36			NOT USED
37	CLOCK O	O	CLOCK OUT (FOR UNILINK)
38	$\overline{\text{BUS ON}}$	O	BUS ON (FOR UNILINK)
39,40			NOT USED
41	DATA I	I	DATA IN (FOR UNILINK)
42	DATA O	O	DATA OUT (FOR UNILINK)
43	CLCK IN	I	CLOCK IN (FOR UNILINK)
44	BU CH	I	BACK-UP CHECK (FOR UNILINK)
45	ACC CH	I	ACC CHECK
46~64			NOT USED

IC403 DSP MICRO-COMPUTER (μPD78224) PIN FUNCTIONS (CONTROL BOARD)

Pin No.	Pin Name	I/O	Function
1~6			NOT USED
7	$\overline{RST}$	I	RESET
8	VDD		
9	X2		
10	X1	I	X'TAL IN
11,12	VSS		
13	IC		INTERNAL CONNECTION
14~16			NOT USED
17	8/$\overline{4}$ FS	O	OVER SAMPLING SELECT
18	IN PUT SELD	O	INPUT SELECT FOR DIGITAL
19	IN PUT SELA	O	INPUT SELECT FOR ANALOG
20~22			NOT USED
23	RMIN	I	REMOTE IN
24	PC	O	POWER COTROL
25			NOT USED
26	SDA	I/O	SERIAL DATA
27	SCL	O	SERIAL CLOCK
28	LINK OFF 2	O	
29	LINK OFF 1	O	LINK OFF SIGNAL (FOR UNILINK)
30	LINK OFF 0	O	
31~38			NOT USED
39	SCLK	O	SERIAL CLOCK FOR DSP ICs,etc.
40	LOAD	O	LOAD FOR P-S CONVERTER
41			NOT USED
42~49	DATA OUT	O	DATA TO RS CONVERTER
50			NOT USED
51,52	VSS		
53	IC		INTERNAL CONNECTION
54,55			NOT USED
56	$\overline{VOL,WR}$	O	WRITE FOR VCA CONTROL IC
57	$\overline{OC}$	O	OUTPUT ENABLE AT LOW
58	FAMUTE	O	FRONT ANALOG MUTE WITH XES-X1
59	MUTE	O	ANALOG MUTE
60,61			NOT USED
62	INIT	O	INITIALIZE FOR DSP,DAI & VCA CONTROL
63	11603,CE	O	PEQ 2nd CHIP ENABLE
64	11602,CE	O	PEQ 1st CHIP ENABLE
65,66	VDD		
67	11601,CE	O	DRS CHIP ENABLE
68	1135F,CE	O	DSP FRONT CHIP ENABLE
69	1135R,CE	O	DSP REAR CHIP ENABLE
70			NOT USED
71	EMP	I	DE EMPHASIS INPUT AT HIGH
72	ERR	I	PARITY ERROR INPUT AT HIGH
73	S1	I	L L 44.1K, L H 48K, H H 32K (fs)
74	S2	I	
75	$\overline{NMI}$	I	INTERRUPT INPUT (FOR UNILINK)
76	$\overline{BUS\ ON}$	I	BUS ON (FOR UNILINK)
77	BUCH	I	BACK-UP CHECK
78~80			NOT USED
81	OVER	I	OVER FLOW INPUT AT LOW

Pin No.	Pin Name	I/O	Function
82	$\overline{A}$/D	I	REMOTE IN
83	BUS DATA IN	I	DATA IN (FOR UNILINK)
84~86			NOT USED
87	BUS CLOCK IN	I	CLOCK IN (FOR UNILINK)
88	BUS DATA OUT	O	DATA OUT (FOR UNILINK)
89~94			NOT USED

SECTION3
UNILINK

Eight types of signals are transmitted with the UNILINK cable. Communication involves two lines: DATA and CLOCK. DATA communication is bidirectional while CLOCK communication adopts the sync output from the MASTER microcomputer. These signals are connected to the MASTER microcomputer and SLAVE microcomputer ports.

① **Reserved.**

② **RESET**

Under normal conditions, LOW. When the system is RESET, ⌐¬.
MASTER outputs this signal.
When resetting SLAVE only, the RESET line will not change.

③ **SIRCS**

Modified electrical signal without the carrier of the infrared remote commander SIRCS signal. Although multiple remote sensors may exist, MASTER decodes the signal, determines the input contents of SIRCS and transmits the contents to each SLAVE.

④ **CLOCK**

Serial data CLOCK line.
MASTER outputs this signal.

⑤ **DATA**

Serial data I/O line. When BUS ON is HIGH, MASTER outputs a 16 msec cycle pulse to inform the data I/O timing to SLAVE. When BUS ON is LOW and SLAVE needs to communicate, SLAVE informs MASTER by setting DATA to LOW. In turn, MASTER sets BUS ON to HIGH and starts communication.

⑥ **BUS ON**

HIGH (5 V) when communication is enabled on BUS.
HIGH when the system is in the WAKE UP mode. Also, HIGH during SLEEP mode when communication is required.
MASTER outputs BUS ON. SLAVE exits from the HALT or STOP mode with the onset of BUS ON.
During INITIAL LINK, SLAVE cuts off (LINK OFF) the BUS ON line and disables the communication of the connected SLAVE.

⑦ **POWER (BACK UP)**

Power (12 V) supplied from the battery.
Continuous 2 A.

⑧ **GND**

Power supply and GND for the communication system.

MASTER Microcomputer

Port	Description
BUS ON	The BUS ON line is HIGH at LOW output and LOW at HIGH output or HIGH impedance. Each SLAVE enters the WAKE UP condition by setting BUS ON to LOW. When communication is enabled, the BUS ON port is always LOW.
DATA IN	Serial DATA input. Detects communication request from SLAVE.
DATA OUT	Serial DATA output port.
SYNC	Port that outputs the pulse which determines the communication timing of the DATA line.
CLOCK OUT	Serial DATA clock output.
BU CHECK	Power supply voltage detection port. Communication is interrupted when power supply voltage drop is detected (BU CHECK = LOW). When power supply voltage returns to HIGH, communication resumes from the start again.

SLAVE Microcomputer

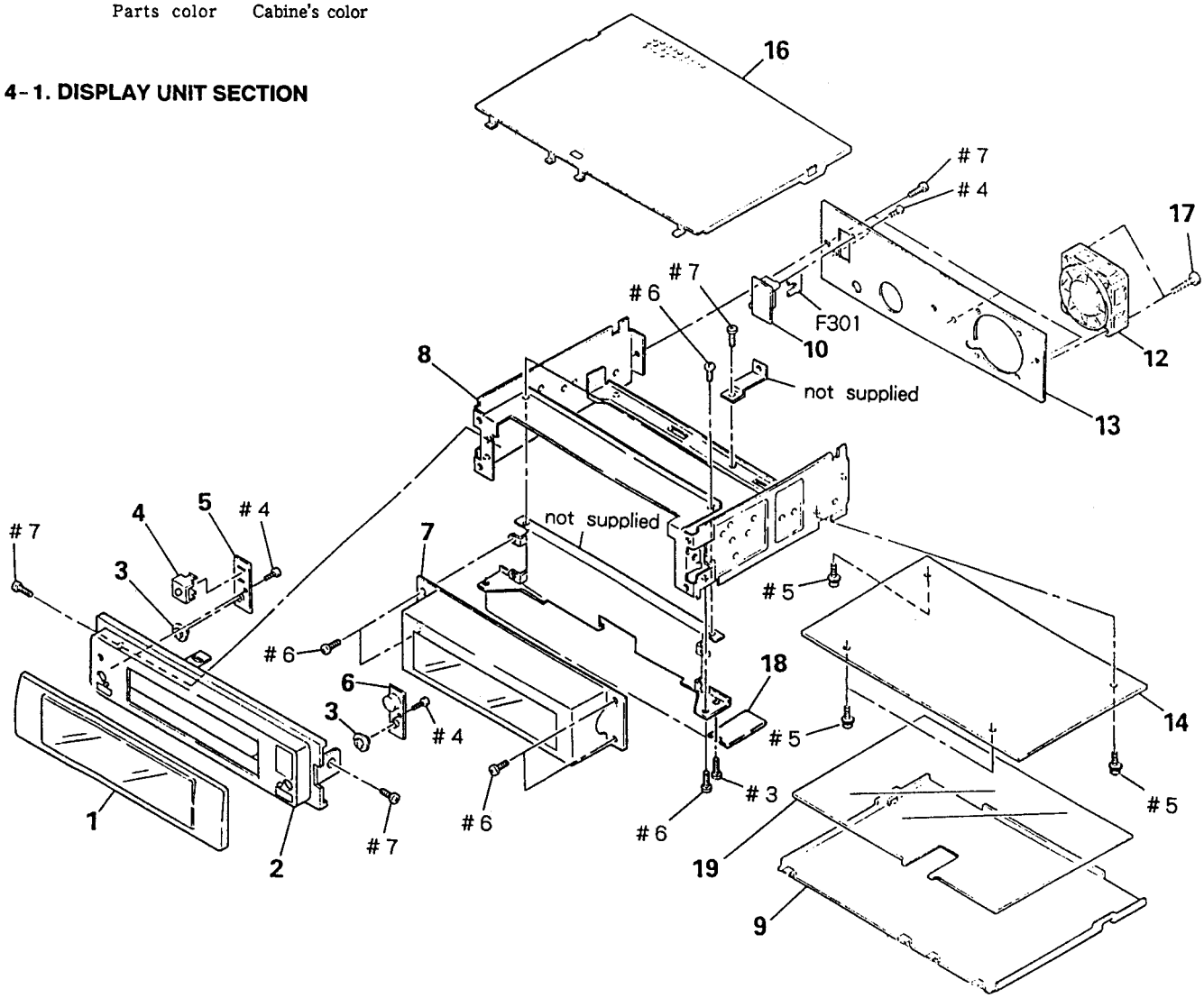
Port	Description
BUS ON	SLAVE must be set to the communication enable condition when the BUS ON port drop to LOW is detected. Communication is enabled when LOW.
DATA IN	Serial DATA input and input for communication timing detection.
DATA OUT	Serial DATA output port.
REQ	Outputs HIGH when requesting communication to MASTER.
CLOCK IN	Serial communication clock input.
LINK OFF	Port to set the BUS ON line of the following connected SLAVE OFF. Turns ON when LOW is output. Turns OFF at HIGH output or HIGH impedance.
BU CHECK	Power supply voltage detection port. SLAVE is determined as cut off from BUS when power supply voltage drop is detected. The MEMBER ADDRESS will be erased.

SECTION 4
EXPLODED VIEWS

NOTE :

- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Color Indication of Appearance Parts
  Example :
  KNOB, BALANCE (WHITE)...(RED)
  ↑ Parts color ↑ Cabine's color
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

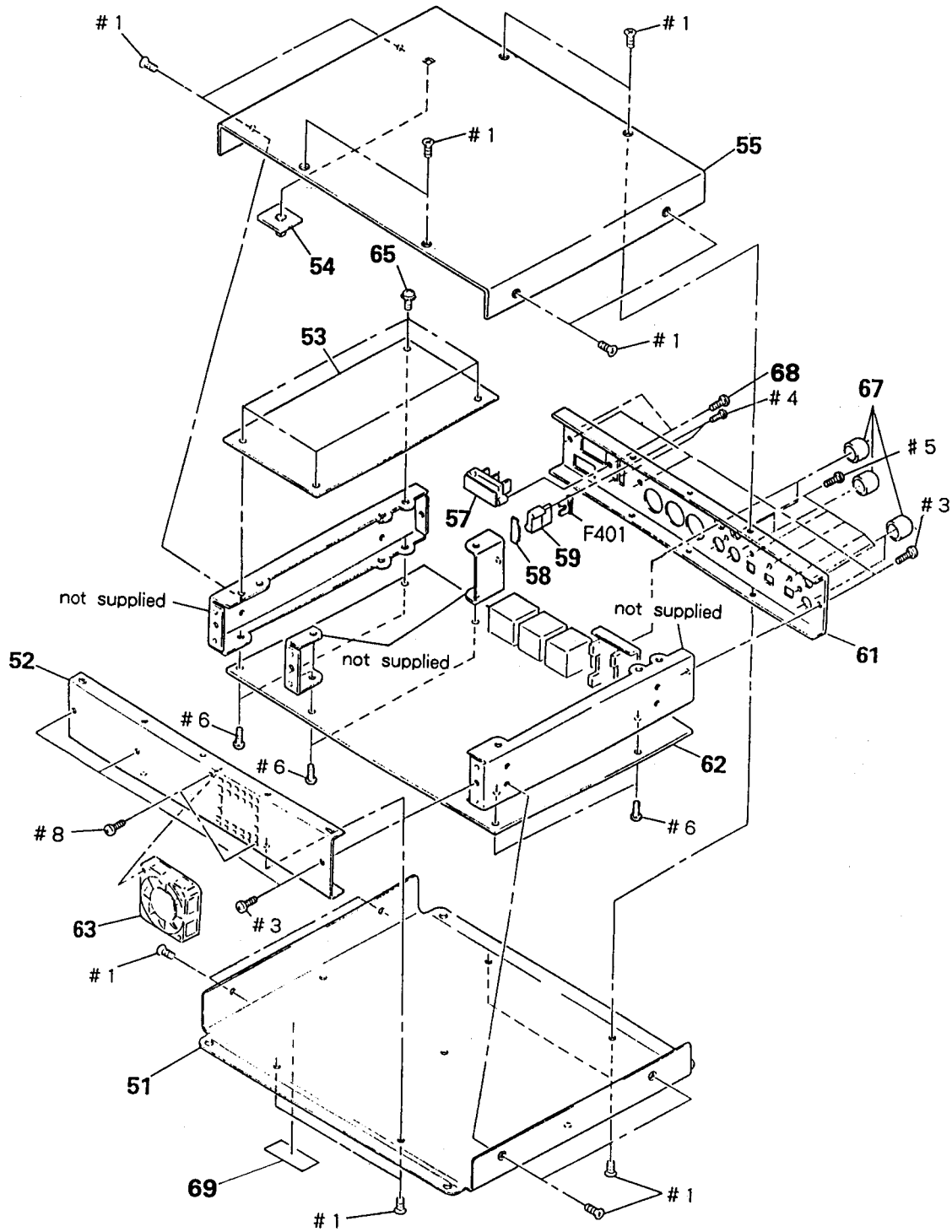
4-1. DISPLAY UNIT SECTION



Ref. No.	Part No.	Description	Remarks
1	X-3362-934-1	PANEL (B) ASSY, FRONT	
2	X-3363-256-1	PANEL (A) ASSY, FRONT	
3	3-366-663-01	KNOB (A)	
4	3-366-664-01	KNOB (B)	
5	* 1-640-010-11	RESET BOARD	
6	* 1-640-011-11	DIMMER BOARD	
7	1-809-281-11	DISPLAY PANEL, LIQUID CRYSTAL	
8	* X-3362-711-1	CHASSIS ASSY	
9	* 3-365-443-11	COVER	
	* 3-365-443-21	COVER (WITH PRINTING)	

Ref. No.	Part No.	Description	Remarks
10	* 1-640-012-12	DISPLAY FUSE HOLDER BOARD	
12	1-541-869-11	MOTOR (FAN)	
13	* 3-366-669-01	PANEL (B)	
14	* A-3273-477-A	DISPLAY BOARD, COMPLETE	
16	* 3-365-443-21	COVER	
17	3-372-144-01	SCREW (+PSW) (2.6X16)	
18	* 3-372-911-01	INSULATOR (HV)	
19	* 3-371-530-01	INSULATOR (3)	
F301	1-532-798-11	FUSE (BRADE TYPE) (AUTO FUSE) (1A)	

4-2. HIDEAWAY UNIT SECTION



Ref. No.	Part No.	Description	Remarks
51	* 3-366-463-03	CASE (LOWER)	
52	* 3-366-464-01	PANEL (F)	
53	* A-3273-473-A	CONTROL BOARD, COMPLETE	
54	* 3-366-469-01	INDICATOR (POWER)	
55	* 3-366-462-03	CASE (UPPER)	
57	* 1-640-015-12	POWER TERMINAL BOARD	
58	* 1-640-016-12	FUSE HOLDER BOARD	
59	1-533-226-11	HOLDER, FUSE (BRAID)	
61	* 3-366-466-01	PANEL (B)	

Ref. No.	Part No.	Description	Remarks
62	* A-3273-471-A	MAIN BOARD, COMPLETE	
63	1-541-869-11	MOTOR (FAN)	
65	3-344-501-11	SCREW (+ PTT 3X8), GROUND POINT	
67	3-339-410-01	COVER, PIN JACK	
68	3-370-361-01	SCREW BS4X8	
69	* 3-372-932-01	LABEL, MODEL NUMBER (AE6) (Germany)	
	* 3-370-220-01	LABEL, MODEL NUMBER (U) (US, Canadian, French, Italian)	
F401	1-532-797-11	FUSE (BRADE TYPE) (AUTO FUSE) (7.5A)	

CONTROL

SECTION 5
ELECTRICAL PARTS LIST

NOTE :

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms.
  METAL : metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u : μ, for example :
  uA... : μA... , uPA... , μPA... ,
  uPB... , μPB... , uPC... , μPC... ,
  uPD..., μPD...
- CAPACITORS :
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description			Remarks
*	A-3273-473-A	CONTROL BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C403	1-126-157-11	ELECT	10uF	20%	16V
C404	1-125-486-11	DUBLE LAYERS	0.22F		5.5V
C406	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C407	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C408	1-124-985-11	ELECT	1000uF	20%	6.3V
C409	1-163-168-00	CERAMIC CHIP	30PF	5%	50V
C410	1-163-168-00	CERAMIC CHIP	30PF	5%	50V
C411	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C412	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C414	1-163-165-00	CERAMIC CHIP	22PF	5%	50V
C415	1-239-077-11	EMI FILTER			
C416	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C601	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C602	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C603	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C729	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
		< CONNECTOR >			
CNP401 *	1-566-004-11	PIN, CONNECTOR (PC BOARD) 7P			
CNP402 *	1-566-006-11	PIN, CONNECTOR (PC BOARD) 9P			
CNP403 *	1-566-009-11	PIN, CONNECTOR (PC BOARD) 12P			
CNP404 *	1-566-011-11	PIN, CONNECTOR (PC BOARD) 14P			
CNP405 *	1-569-973-11	PLUG, CONNECTOR 2P			
CNP406 *	1-569-974-11	PLUG, CONNECTOR 3P			
		< DIODE >			
D401	8-719-976-19	DIODE	RLS-4148		
D402	8-719-972-76	DIODE	RLZ-J6.8A-TE11		
D403	8-719-421-07	DIODE	LN35GCP(POWER)		
D404	8-719-976-19	DIODE	RLS-4148		
D405	8-719-976-19	DIODE	RLS-4148		
D406	8-719-400-18	DIODE	MA152WK		
D407	8-719-976-19	DIODE	RLS-4148		
D409	8-719-976-19	DIODE	RLS-4148		
D410	8-719-945-59	DIODE	DSA3A4		
D411	8-719-976-19	DIODE	RLS-4148		
D412	8-719-976-19	DIODE	RLS-4148		
D601	8-719-976-19	DIODE	RLS-4148		
D602	8-719-976-19	DIODE	RLS-4148		
D603	8-719-976-19	DIODE	RLS-4148		
D604	8-719-976-19	DIODE	RLS-4148		
		< IC >			
IC401	8-759-940-45	IC	S-8054HN-CB		
IC402	8-759-154-80	IC	uPD75116-GF-E22-3BE		
IC403	8-759-154-79	IC	uPD78224GJ-562-5BG		
IC404	8-759-513-44	IC	X24C16SI		
IC405	8-759-926-25	IC	SN74HC165NS		
IC406	8-759-031-84	IC	SC7S04F		
IC407	8-759-710-82	IC	NJM2406F		
		< TRANSISTOR >			
Q404	8-729-808-01	TRANSISTOR	2SD1622-S		
Q405	8-729-216-22	TRANSISTOR	2SA1162		
Q406	8-729-216-22	TRANSISTOR	2SA1162		
Q407	8-729-216-22	TRANSISTOR	2SA1162		
Q408	8-729-810-36	TRANSISTOR	2SB1203-T		
Q409	8-729-901-00	TRANSISTOR	DTC124EK		
Q410	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q411	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q412	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q413	8-729-901-05	TRANSISTOR	DTA124EK		
Q414	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q415	8-729-901-05	TRANSISTOR	DTA124EK		
Q417	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q418	8-729-230-49	TRANSISTOR	2SC2712-YG		
Q419	8-729-216-22	TRANSISTOR	2SA1162		

Ref. No.	Part No.	Description				Remarks
Q601	8-729-230-49	TRANSISTOR	2SC2712-YG			
Q602	8-729-901-00	TRANSISTOR	DTC124EK			
Q603	8-729-901-00	TRANSISTOR	DTC124EK			
Q604	8-729-901-00	TRANSISTOR	DTC124EK			
		< RESISTOR >				
R401	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R402	1-260-002-11	CARBON MELF	3.3K	1%	1/8W	
R403	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R404	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R405	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R406	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R407	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R409	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R410	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R411	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R412	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R413	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R414	1-259-999-11	CARBON MELF	2.2K	1%	1/8W	
R415	1-260-012-11	CARBON MELF	22K	1%	1/8W	
R416	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R417	1-260-012-11	CARBON MELF	22K	1%	1/8W	
R418	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R419	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R420	1-260-020-11	CARBON MELF	100K	1%	1/8W	
R421	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R422	1-260-003-11	CARBON MELF	3.9K	1%	1/8W	
R425	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R426	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R427	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R428	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R429	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R430	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R431	1-260-020-11	CARBON MELF	100K	1%	1/8W	
R432	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R433	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R436	1-259-983-11	CARBON MELF	100	1%	1/8W	
R437	1-259-983-11	CARBON MELF	100	1%	1/8W	
R438	1-259-983-11	CARBON MELF	100	1%	1/8W	
R439	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R440	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R441	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R442	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R445	1-260-002-11	CARBON MELF	3.3K	1%	1/8W	

Ref. No.	Part No.	Description				Remarks
R446	1-260-002-11	CARBON MELF	3.3K	1%	1/8W	
R447	1-260-002-11	CARBON MELF	3.3K	1%	1/8W	
R448	1-260-012-11	CARBON MELF	22K	1%	1/8W	
R449	1-260-020-11	CARBON MELF	100K	1%	1/8W	
R450	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R451	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R452	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R601	1-260-020-11	CARBON MELF	100K	1%	1/8W	
R602	1-260-020-11	CARBON MELF	100K	1%	1/8W	
R603	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R604	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R605	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R606	1-260-020-11	CARBON MELF	100K	1%	1/8W	
		< VARISTOR >				
VD401	1-807-601-11	CERAMIC VARISTOR				
		< CRYSTAL >				
X401	1-567-797-11	VIBRATOR, CERAMIC				
X402	1-567-775-11	VIBRATOR, CERAMIC				
**********						
*	1-640-011-13	DIMMER BOARD				
		**********				
	9-911-840-XX	SPACER				
		< CAPACITOR >				
C351	1-164-004-11	CERAMIC CHIP	0.1uF		10% 25V	
		< IC >				
IC303	8-749-900-36	IC BX1393				
		< TRANSISTOR >				
Q451	8-729-110-21	TRANSISTOR PH102				
		< VARIABLE RESISTOR >				
VR401	1-226-704-11	RES, ADJ, METAL GLAZE 470K (DIM)				
**********						

DISPLAY

Ref. No.	Part No.	Description			Remarks
*	A-3273-477-A	DISPLAY BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C301	1-126-096-11	ELECT	10uF	20% 35V	
C302	1-126-096-11	ELECT	10uF	20% 35V	
C303	1-125-486-11	DUBLE LAYERS	0.22F	5.5V	
C304	1-126-162-11	ELECT	3.3uF	20% 50V	
C305	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C306	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C307	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C308	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C309	1-163-105-00	CERAMIC CHIP	33PF	5% 50V	
C310	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C311	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C312	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C313	1-126-162-11	ELECT	3.3uF	20% 50V	
C314	1-124-589-11	ELECT	47uF	20% 16V	
C315	1-163-135-00	CERAMIC CHIP	560P	5% 50V	
C316	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C317	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C318	1-163-135-00	CERAMIC CHIP	560P	5% 50V	
C319	1-163-135-00	CERAMIC CHIP	560P	5% 50V	
C320	1-163-135-00	CERAMIC CHIP	560P	5% 50V	
C321	1-163-135-00	CERAMIC CHIP	560P	5% 50V	
C401	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C402	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C403	1-130-495-00	MYLAR	0.1uF	5% 50V	
C404	1-162-980-11	CERAMIC	22PF	5% 2KV	
C405	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C406	1-164-004-11	CERAMIC CHIP	0.1uF	10% 25V	
C407	1-126-162-11	ELECT	3.3uF	20% 50V	
C408	1-126-096-11	ELECT	10uF	20% 35V	
C409	1-126-096-11	ELECT	10uF	20% 35V	
C410	1-124-478-11	ELECT	100uF	20% 25V	
C411	1-124-478-11	ELECT	100uF	20% 25V	
C412	1-124-589-11	ELECT	47uF	20% 16V	
C413	1-163-227-11	CERAMIC CHIP	10P	5% 50V	
C414	1-124-589-11	ELECT	47uF	20% 16V	
C415	1-124-478-11	ELECT	100uF	20% 25V	
C416	1-124-589-11	ELECT	47uF	20% 16V	
C601	1-164-232-11	CERAMIC CHIP	0.01uF	50V	
C602	1-163-037-11	CERAMIC CHIP	0.022uF	10% 25V	
C603	1-164-232-11	CERAMIC CHIP	0.01uF	50V	

Ref. No.	Part No.	Description	Remarks
		< CONNECTOR >	
CN301	1-580-907-11	PLUG, CONNECTOR(UNI LINK)	
CN302	1-563-280-31	JACK (REMOTE)	
CN303	* 1-506-985-11	PIN, CONNECTOR (PC BOARD) 3P	
CN304	* 1-506-985-11	PIN, CONNECTOR (PC BOARD) 3P	
CN305	* 1-506-990-11	PIN, CONNECTOR (PC BOARD) 8P	
CN306	* 1-564-104-00	PIN, CONNECTOR (B3P-VH) 3P	
CN307	* 1-506-984-11	PIN, CONNECTOR (PC BOARD) 2P	
CN308	* 1-506-984-31	PIN, CONNECTOR (PC BOARD) 2P	
CN309	* 1-506-984-11	PIN, CONNECTOR (PC BOARD) 2P	
CN310	* 1-573-202-11	PIN, CONNECTOR 2P	
		< DIODE >	
D301	8-719-109-96	DIODE RD6.8ES-B1	
D302	8-719-109-93	DIODE RD6.2ES-B2	
D303	8-719-976-19	DIODE RLS-4148	
D304	8-719-976-19	DIODE RLS-4148	
D305	8-719-976-19	DIODE RLS-4148	
D306	8-719-104-34	DIODE 1S2836	
D307	8-719-104-34	DIODE 1S2836	
D308	8-719-976-19	DIODE RLS-4148	
D309	8-719-976-19	DIODE RLS-4148	
D310	8-719-109-96	DIODE RD6.8ES-B1	
D401	8-719-210-21	DIODE 11EQS04	
D402	8-719-976-19	DIODE RLS-4148	
D403	8-719-976-19	DIODE RLS-4148	
D404	8-719-210-21	DIODE 11EQS04	
D405	8-719-210-21	DIODE 11EQS04	
D601	8-719-104-34	DIODE 1S2836	
D602	8-719-972-03	DIODE RLZ-J6.2B	
D603	8-719-972-03	DIODE RLZ-J6.2B	
D604	8-719-972-03	DIODE RLZ-J6.2B	
D605	8-719-972-03	DIODE RLZ-J6.2B	
D606	8-719-972-03	DIODE RLZ-J6.2B	
		< DC-DC UNIT >	
DD401	1-466-494-11	CONVERTER UNIT, DC-DC	
		< IC >	
IC302	8-759-637-21	IC M37450M8-392FP	
IC304	8-759-322-71	IC HM62256LFP-12TZ	
IC305	8-759-039-73	IC HN623257FZ29TL	
IC306	8-759-925-74	IC SN74HC04ANS	
IC307	8-759-925-78	IC SN74HC10NS	

Ref. No.	Part No.	Description	Remarks
IC308	8-759-246-11	IC T6963C	
IC309	8-759-320-65	IC HM6264ALFP-12TZ	
IC401	8-759-103-87	IC uPC494C	
IC402	8-759-982-07	IC NJM7808FA	
IC403	8-759-037-42	IC MC33063AP1	
IC601	8-759-940-45	IC S-8054HN-CB	
IC602	8-759-981-65	IC LM2903M	
		< COIL >	
L401	1-424-494-11	COIL, CHOKE 680uH	
L402	1-409-488-21	COIL, FILTER	
		< TRANSISTOR >	
Q301	8-729-808-02	TRANSISTOR 2SD1622	
Q302	8-729-230-49	TRANSISTOR 2SC2712-G	
Q303	8-729-230-49	TRANSISTOR 2SC2712-G	
Q304	8-729-230-49	TRANSISTOR 2SC2712-G	
Q305	8-729-901-00	TRANSISTOR DTC124EK	
Q306	8-729-901-00	TRANSISTOR DTC124EK	
Q307	8-729-901-05	TRANSISTOR DTA124EK	
Q308	8-729-901-00	TRANSISTOR DTC124EK	
Q309	8-729-216-22	TRANSISTOR 2SA1162-YG	
Q310	8-729-230-49	TRANSISTOR 2SC2712-G	
Q311	8-729-230-49	TRANSISTOR 2SC2712-G	
Q401	8-729-808-02	TRANSISTOR 2SD1622	
Q402	8-729-808-02	TRANSISTOR 2SD1622	
Q403	8-729-810-36	TRANSISTOR 2SB1203T	
Q404	8-729-901-00	TRANSISTOR DTC124EK	
Q405	8-729-810-36	TRANSISTOR 2SB1203T	
Q407	8-729-901-00	TRANSISTOR DTC124EK	
Q408	8-729-300-76	TRANSISTOR 2SA1262Y	
Q409	8-729-901-05	TRANSISTOR DTA124EK	
Q601	8-729-230-49	TRANSISTOR 2SC2712-G	
Q602	8-729-230-49	TRANSISTOR 2SC2712-G	
Q603	8-729-230-49	TRANSISTOR 2SC2712-G	
Q608	8-729-901-05	TRANSISTOR DTA124EK	
		< RESISTOR >	
R301	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R302	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R303	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R306	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R307	1-216-081-00	METAL CHIP 22K 5% 1/10W	

Ref. No.	Part No.	Description	Remarks
R308	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R309	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R310	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R311	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R312	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R313	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R314	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R315	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R316	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R317	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R318	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R319	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R320	1-216-066-00	METAL CHIP 5.1K 5% 1/10W	
R321	1-216-066-00	METAL CHIP 5.1K 5% 1/10W	
R322	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R323	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R324	1-216-032-00	METAL CHIP 200 5% 1/10W	
R325	1-216-032-00	METAL CHIP 200 5% 1/10W	
R326	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R401	1-216-210-00	METAL GLAZE 3.3K 5% 1/8W	
R402	1-216-210-00	METAL GLAZE 3.3K 5% 1/8W	
R403	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R404	1-216-113-11	METAL CHIP 470K 5% 1/10W	
R405	1-216-103-11	METAL CHIP 180K 5% 1/10W	
R406	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R407	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R408	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R409	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R410	1-214-996-00	METAL CHIP 0.47 1% 1/4W	
R411	1-214-996-00	METAL CHIP 0.47 1% 1/4W	
R412	1-214-996-00	METAL CHIP 0.47 1% 1/4W	
R413	1-216-185-00	METAL CHIP 300 5% 1/8W	
R414	1-216-178-00	METAL CHIP 150 5% 1/8W	
R415	1-214-072-00	METAL CHIP 9.1K 5% 1/10W	
R416	1-216-052-00	METAL CHIP 1.3K 5% 1/10W	
R417	1-216-056-00	METAL CHIP 2K 5% 1/10W	
R418	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R601	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R602	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R603	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R604	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R605	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R606	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R607	1-216-081-00	METAL CHIP 22K 5% 1/10W	
R608	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	

DISPLAY | DISPLAY FUSE HOLDER | FUSE HOLDER | MAIN

Ref. No.	Part No.	Description				Remarks
R609	1-216-063-00	METAL CHIP	3.9K	5%	1/10W	
R610	1-216-065-00	METAL CHIP	4.7K	5%	1/10W	
R611	1-216-089-00	METAL CHIP	47K	5%	1/10W	
R612	1-216-105-00	METAL CHIP	220K	5%	1/10W	
R613	1-216-105-00	METAL CHIP	220K	5%	1/10W	
		< SWITCH >				
SW302	1-553-510-00	SWITCH, SLIDE				
		< TRANSFORMER >				
T401	1-450-371-11	TRANSFORMER, POWER				
		< THERMISTOR >				
TH401	1-809-364-21	THERMISTOR NTC 150K				
		< CRYSTAL >				
X301	1-567-133-00	VIBLATOR, CERAMIC				
X302	1-579-175-11	VIBRATOR, CERAMIC				
X303	1-529-078-11	BUZZER, PIEZOELECTRIC				
**********						
*	1-640-012-12	DISPLAY FUSE HOLDER BOARD				
		**********				
		< CONNECTOR >				
CN311 *	1-573-202-11	PIN, CONNECTOR 2P				
CNJ301	1-533-226-11	HOLDER, FUSE (BRAID)				
**********						
*	1-640-016-12	FUSE HOLDER BOARD				
		**********				
	1-533-226-11	HOLDER, FUSE (BRAID)				
**********						
*	A-3273-471-A	MAIN BOARD, COMPLETE				
		**********				
		< CAPACITOR >				
C101	1-130-495-00	MYLAR	0.1uF	5%	50V	
C102	1-130-495-00	MYLAR	0.1uF	5%	50V	
C103	1-123-369-00	ELECT	4.7uF	20%	50V	
C104	1-123-369-00	ELECT	4.7uF	20%	50V	
C105	1-123-369-00	ELECT	4.7uF	20%	50V	

Ref. No.	Part No.	Description			Remarks
C106	1-123-369-00	ELECT	4.7uF	20%	50V
C107	1-123-369-00	ELECT	4.7uF	20%	50V
C108	1-123-369-00	ELECT	4.7uF	20%	50V
C109	1-130-495-00	MYLAR	0.1uF	5%	50V
C110	1-130-495-00	MYLAR	0.1uF	5%	50V
C111	1-130-495-00	MYLAR	0.1uF	5%	50V
C112	1-130-495-00	MYLAR	0.1uF	5%	50V
C113	1-106-351-00	MYLAR	2200PF	5%	200V
C114	1-106-351-00	MYLAR	2200PF	5%	200V
C115	1-106-351-00	MYLAR	2200PF	5%	200V
C116	1-106-351-00	MYLAR	2200PF	5%	200V
C117	1-130-495-00	MYLAR	0.1uF	5%	50V
C118	1-130-495-00	MYLAR	0.1uF	5%	50V
C119	1-130-495-00	MYLAR	0.1uF	5%	50V
C120	1-130-495-00	MYLAR	0.1uF	5%	50V
C121	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C122	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C123	1-130-495-00	MYLAR	0.1uF	5%	50V
C124	1-130-495-00	MYLAR	0.1uF	5%	50V
C125	1-124-034-51	ELECT	33uF	20%	16V
C126	1-124-034-51	ELECT	33uF	20%	16V
C127	1-123-380-00	ELECT	1uF	20%	50V
C128	1-123-380-00	ELECT	1uF	20%	50V
C129	1-136-165-00	FILM	0.1uF	5%	50V
C130	1-136-165-00	FILM	0.1uF	5%	50V
C133	1-124-034-51	ELECT	33uF	20%	16V
C134	1-124-034-51	ELECT	33uF	20%	16V
C135	1-123-380-00	ELECT	1uF	20%	50V
C136	1-123-380-00	ELECT	1uF	20%	50V
C137	1-123-369-00	ELECT	4.7uF	20%	50V
C138	1-123-369-00	ELECT	4.7uF	20%	50V
C141	1-123-369-00	ELECT	4.7uF	20%	50V
C142	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C143	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C144	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C145	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C146	1-163-197-00	CERAMIC CHIUP	470PF	5%	50V
C147	1-163-197-00	CERAMIC CHIUP	470PF	5%	50V
C148	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C149	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C201	1-130-495-00	MYLAR	0.1uF	5%	50V
C202	1-130-495-00	MYLAR	0.1uF	5%	50V
C203	1-123-369-00	ELECT	4.7uF	20%	50V
C204	1-123-369-00	ELECT	4.7uF	20%	50V
C205	1-123-369-00	ELECT	4.7uF	20%	50V

Ref. No.	Part No.	Description			Remarks
C206	1-123-369-00	ELECT	4.7uF	20%	50V
C207	1-123-369-00	ELECT	4.7uF	20%	50V
C208	1-123-369-00	ELECT	4.7uF	20%	50V
C209	1-130-495-00	MYLAR	0.1uF	5%	50V
C210	1-130-495-00	MYLAR	0.1uF	5%	50V
C211	1-130-495-00	MYLAR	0.1uF	5%	50V
C212	1-130-495-00	MYLAR	0.1uF	5%	50V
C213	1-106-351-00	MYLAR	2200PF	5%	200V
C214	1-106-351-00	MYLAR	2200PF	5%	200V
C215	1-106-351-00	MYLAR	2200PF	5%	200V
C216	1-106-351-00	MYLAR	2200PF	5%	200V
C217	1-130-495-00	MYLAR	0.1uF	5%	50V
C218	1-130-495-00	MYLAR	0.1uF	5%	50V
C219	1-130-495-00	MYLAR	0.1uF	5%	50V
C220	1-130-495-00	MYLAR	0.1uF	5%	50V
C221	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C222	1-163-213-00	CERAMIC CHIP	0.0022uF	5%	50V
C223	1-130-495-00	MYLAR	0.1uF	5%	50V
C224	1-130-495-00	MYLAR	0.1uF	5%	50V
C225	1-124-034-51	ELECT	33uF	20%	16V
C226	1-124-034-51	ELECT	33uF	20%	16V
C229	1-136-165-00	FILM	0.1uF	5%	50V
C230	1-136-165-00	FILM	0.1uF	5%	50V
C233	1-124-034-51	ELECT	33uF	20%	16V
C234	1-124-034-51	ELECT	33uF	20%	16V
C235	1-123-380-00	ELECT	1uF	20%	50V
C236	1-123-380-00	ELECT	1uF	20%	50V
C237	1-123-369-00	ELECT	4.7uF	20%	50V
C238	1-123-369-00	ELECT	4.7uF	20%	50V
C241	1-123-369-00	ELECT	4.7uF	20%	50V
C242	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C243	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C244	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C245	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C246	1-163-197-00	CERAMIC CHIUP	470PF	5%	50V
C247	1-163-197-00	CERAMIC CHIUP	470PF	5%	50V
C248	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C249	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C301	1-123-380-00	ELECT	1uF	20%	50V
C302	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C303	1-239-077-11	EMI, FILTER			
C304	1-163-205-00	CERAMIC CHIP	0.001uF	5%	50V
C501	1-126-022-11	ELECT	47uF	20%	10V
C502	1-126-022-11	ELECT	47uF	20%	10V
C503	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C504	1-164-027-11	CERAMIC	22PF	5%	50V
C505	1-164-027-11	CERAMIC	22PF	5%	50V
C506	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C507	1-126-059-11	ELECT	10uF	20%	50V
C508	1-130-495-00	MYLAR	0.1uF	5%	50V
C509	1-130-495-00	MYLAR	0.1uF	5%	50V
C510	1-124-239-00	ELECT	6.9uF	20%	10V
C511	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C512	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C513	1-126-059-11	ELECT	10uF	20%	50V
C514	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C515	1-163-055-00	CERAMIC CHIP	4700P	10%	50V
C516	1-163-055-00	CERAMIC CHIP	4700P	10%	50V
C517	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C518	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C519	1-126-023-11	ELECT	100uF	20%	25V
C520	1-130-495-00	MYLAR	0.1uF	5%	50V
C521	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C522	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C523	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C524	1-163-169-00	CERAMIC CHIP	33PF	5%	50V
C525	1-163-169-00	CERAMIC CHIP	33PF	5%	50V
C526	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C527	1-130-495-00	MYLAR	0.1uF	5%	50V
C528	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C529	1-130-495-00	MYLAR	0.1uF	5%	50V
C530	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C531	1-130-495-00	MYLAR	0.1uF	5%	50V
C532	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C533	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C534	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C535	1-130-495-00	MYLAR	0.1uF	5%	50V
C536	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C537	1-130-495-00	MYLAR	0.1uF	5%	50V
C538	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C539	1-163-165-00	CERAMIC CHIP	22PF	5%	50V
C540	1-163-165-00	CERAMIC CHIP	22PF	5%	50V
C541	1-163-165-00	CERAMIC CHIP	22PF	5%	50V
C542	1-163-165-00	CERAMIC CHIP	22PF	5%	50V
C543	1-126-022-11	ELECT	47uF	20%	10V
C545	1-163-057-00	CERAMIC CHIP	0.0068uF	10%	50V
C546	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C547	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C548	1-130-495-00	MYLAR	0.1uF	5%	50V
C549	1-130-495-00	MYLAR	0.1uF	5%	50V

MAIN

Ref. No.	Part No.	Description			Remarks
C550	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C551	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C552	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C553	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C554	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C555	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C556	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C557	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C558	1-163-059-00	CERAMIC CHIP	0.01uF	10%	50V
C559	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C560	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C561	1-163-055-00	CERAMIC CHIP	4700P	10%	50V
C562	1-163-055-00	CERAMIC CHIP	4700P	10%	50V
C565	1-163-157-00	CERAMIC CHIP	10P	5%	50V
C566	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C567	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C568	1-163-181-00	CERAMIC CHIUP	100PF	5%	50V
C569	1-239-077-11	EMI, FILTER			
C570	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C571	1-135-157-21	TANTAL CHIP	10uF	20%	6.3V
C572	1-239-077-11	EMI, FILTER			
C701	1-126-027-11	ELECT	1000uF	20%	25V
C702	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C703	1-135-091-00	TANTAL CHIP	1uF	20%	16V
C704	1-124-913-11	ELECT	470uF	20%	25V
C705	1-124-913-11	ELECT	470uF	20%	25V
C706	1-124-913-11	ELECT	470uF	20%	25V
C707	1-124-913-11	ELECT	470uF	20%	25V
C708	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C709	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C710	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C711	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C713	1-239-077-11	FILTER, EMI			
C714	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C715	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C716	1-163-173-00	CERAMIC CHIP	47PF	5%	50V
C717	1-163-173-00	CERAMIC CHIP	47PF	5%	50V
C718	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C719	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C720	1-239-077-11	EMI FILTER			
C722	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C723	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C724	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C725	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C726	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C727	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V

Ref. No.	Part No.	Description			Remarks
C728	1-126-059-11	ELECT	10uF	20%	50V
		< CONNECTOR >			
CNJ1	1-568-069-11	JACK, PIN 4P (FRONTE/REAR)			
CNJ2	1-565-352-71	JACK, PIN 2P (ANALOG)			
CNP1	* 1-506-989-11	PIN, CONNECTOR (PC BOARD) 7P			
CNP2	* 1-506-991-11	PIN, CONNECTOR (PC BOARD) 9P			
CNP3	* 1-506-994-11	PIN, CONNECTOR (PC BOARD) 12P			
CNP4	* 1-506-996-11	PIN, CONNECTOR (PC BOARD) 14P			
CNP5	1-566-213-11	PIN, CONNECTOR 4P			
CNP6	1-580-907-11	PLUG, CONNECTOR (DISPLAY/XES-X1)			
CNP7	1-580-907-11	PLUG, CONNECTOR (CHANGER)			
CNP8	1-580-907-11	PLUG, CONNECTOR (TUNER)			
CNP11	* 1-564-187-11	PIN, CONNECTOR			
		< DIODE >			
D101	8-719-976-19	DIODE RLS-4148			
D102	8-719-976-19	DIODE RLS-4148			
D301	8-719-972-03	DIODE RLZ-J6.2B			
D302	8-719-972-03	DIODE RLZ-J6.2B			
D303	8-719-972-03	DIODE RLZ-J6.2B			
D304	8-719-972-03	DIODE RLZ-J6.2B			
D501	8-719-976-19	DIODE RLS-4148			
D502	8-719-976-19	DIODE RLS-4148			
D503	8-719-976-19	DIODE RLS-4148			
D504	8-719-976-19	DIODE RLS-4148			
D505	8-719-976-19	DIODE RLS-4148			
D506	8-719-976-19	DIODE RLS-4148			
D507	8-719-976-19	DIODE RLS-4148			
D701	8-719-972-90	DIODE RLZ-J7.5B			
D702	8-719-973-03	DIODE RLZ-J8.2B			
		< DC-DC UNIT >			
DD1	1-466-495-11	CONVERTER UNIT, DC-DC			
		< IC >			
IC101	8-759-979-09	IC PCM58P-K			
IC102	8-759-979-09	IC PCM58P-K			
IC103	8-759-990-82	IC TL082CP			
IC104	8-759-990-82	IC TL082CP			
IC105	8-759-990-82	IC TL082CP			
IC106	8-759-990-82	IC TL082CP			
IC201	8-759-979-09	IC PCM58P-K			
IC202	8-759-979-09	IC PCM58P-K			
IC203	8-759-990-82	IC TL082CP			

Ref. No.	Part No.	Description	Remarks
IC204	8-759-990-82	IC TL082CP	
IC205	8-759-990-82	IC TL082CP	
IC206	8-759-990-82	IC TL082CP	
IC301	8-759-635-26	IC M5283P	
IC302	8-759-635-26	IC M5283P	
IC303	8-759-990-82	IC TL082CP	
IC304	8-759-990-82	IC TL082CP	
IC305	8-759-636-43	IC M66242FP	
IC501	8-749-921-11	IC GP1F32R (CHANGER DIGITAL)	
IC502	8-749-921-11	IC GP1F32R (DIGITAL)	
IC503	8-759-926-18	IC SN74HC157ANS	
IC504	8-759-973-98	IC YM3623B	
IC505	8-759-631-00	IC M5280FP	
IC506	8-759-504-36	IC CS5339-KP	
IC507	8-759-926-18	IC SN74HC157ANS	
IC508	8-759-233-64	IC TC74HCU04AF	
IC509	8-752-331-87	IC CXD1160AP	
IC510	8-752-331-87	IC CXD1160AP	
IC511	8-752-331-87	IC CXD1160AP	
IC512	8-759-032-01	IC MC74HC00AF	
IC513	8-759-520-53	IC CXD1355AQ	
IC514	8-759-520-53	IC CXD1355AQ	
IC515	8-759-506-48	IC MSM514256A-80RS-B	
IC516	8-759-506-48	IC MSM514256A-80RS-B	
IC517	8-759-513-19	IC SM5823AP	
IC518	8-752-329-50	IC CXD1211P	
IC519	8-749-921-12	IC GP1F32T (FRONTE DIGITAL)	
IC520	8-759-032-23	IC MC74HC74AF	
IC521	8-759-032-23	IC MC74HC74AF	
IC522	8-759-032-23	IC MC74HC74AF	
IC523	8-759-008-48	IC MC74HC86F	
IC524	8-759-035-93	IC TC7S32F	
IC525	8-759-990-82	IC TL082CP	
IC526	8-759-031-84	IC TC7S04F	
IC701	8-759-982-31	IC RC78M05FA	
IC702	8-759-982-36	IC RC78M15FA	
IC703	8-759-982-31	IC RC78M05FA	
IC704	8-759-982-52	IC RC79M05FA	
IC705	8-759-701-70	IC NJM79M15FA	
IC706	8-759-982-48	IC RC79L12A	
		< COIL >	
L101	1-410-397-21	FERRITE BEAD INDUCTOR 1.1uH	
L102	1-410-397-21	FERRITE BEAD INDUCTOR 1.1uH	
L103	1-410-397-21	FERRITE BEAD INDUCTOR 1.1uH	
L201	1-410-397-21	FERRITE BEAD INDUCTOR 1.1uH	
L202	1-410-397-21	FERRITE BEAD INDUCTOR 1.1uH	
L203	1-410-397-21	FERRITE BEAD INDUCTOR 1.1uH	
L501	1-410-200-31	COIL, CHIP 4.7uH	
		< RELAY >	
LY701	1-515-683-11	RELAY	
LY702	1-515-683-11	RELAY	
		< TRANSISTOR >	
Q501	8-729-901-00	TRANSISTOR DTC124EK	
Q502	8-729-901-00	TRANSISTOR DTC124EK	
Q503	8-729-901-00	TRANSISTOR DTC124EK	
Q504	8-729-901-00	TRANSISTOR DTC124EK	
Q701	8-729-810-36	TRANSISTOR 2SB1203-T	
Q702	8-729-901-00	TRANSISTOR DTC124EK	
Q703	8-729-804-41	TRANSISTOR 2SB1122-S	
Q704	8-729-901-00	TRANSISTOR DTC124EK	
Q705	8-729-901-00	TRANSISTOR DTC124EK	
Q706	8-729-901-00	TRANSISTOR DTC124EK	
Q707	8-729-810-36	TRANSISTOR 2SB1203-T	
Q708	8-729-230-49	TRANSISTOR 2SC2712-G	
Q709	8-729-230-49	TRANSISTOR 2SC2712-G	
Q711	8-729-901-00	TRANSISTOR DTC124EK	
Q712	8-729-230-49	TRANSISTOR 2SC2712-G	
Q713	8-729-901-00	TRANSISTOR DTC124EK	
Q714	8-729-804-41	TRANSISTOR 2SB1122-S	
		< RESISTOR >	
R101	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R102	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R103	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R104	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R105	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R106	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R107	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R108	1-259-997-11	CARBON MELF 1.5K 1% 1/8W	
R109	1-216-191-00	CARBON MELF 510 1% 1/8W	
R110	1-216-191-00	CARBON MELF 510 1% 1/8W	
R111	1-260-016-11	CARBON MELF 47K 1% 1/8W	
R112	1-260-016-11	CARBON MELF 47K 1% 1/8W	
R113	1-260-008-11	CARBON MELF 10K 1% 1/8W	
R114	1-260-008-11	CARBON MELF 10K 1% 1/8W	
R115	1-259-995-11	CARBON MELF 1K 1% 1/8W	

MAIN

Ref. No.	Part No.	Description				Remarks
R116	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R117	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R118	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R119	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R120	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R121	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R122	1-259-983-11	CARBON MELF	100	1%	1/8W	
R123	1-259-933-11	CARBON MELF	7.5K	1%	1/8W	
R124	1-259-933-11	CARBON MELF	7.5K	1%	1/8W	
R125	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R201	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R202	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R203	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R204	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R205	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R206	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R207	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R208	1-259-997-11	CARBON MELF	1.5K	1%	1/8W	
R209	1-216-191-00	CARBON MELF	510	1%	1/8W	
R210	1-216-191-00	CARBON MELF	510	1%	1/8W	
R211	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R212	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R213	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R214	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R215	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R216	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R217	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R218	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R219	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R220	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R221	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R222	1-259-983-11	CARBON MELF	100	1%	1/8W	
R223	1-259-933-11	CARBON MELF	7.5K	1%	1/8W	
R224	1-259-933-11	CARBON MELF	7.5K	1%	1/8W	
R225	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R501	1-259-983-11	CARBON MELF	100	1%	1/8W	
R502	1-259-983-11	CARBON MELF	100	1%	1/8W	
R503	1-259-983-11	CARBON MELF	100	1%	1/8W	
R504	1-260-032-11	CARBON MELF	1M	1%	1/8W	
R506	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R507	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R508	1-259-983-11	CARBON MELF	100	1%	1/8W	
R509	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R510	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R511	1-259-991-11	CARBON MELF	470	1%	1/8W	

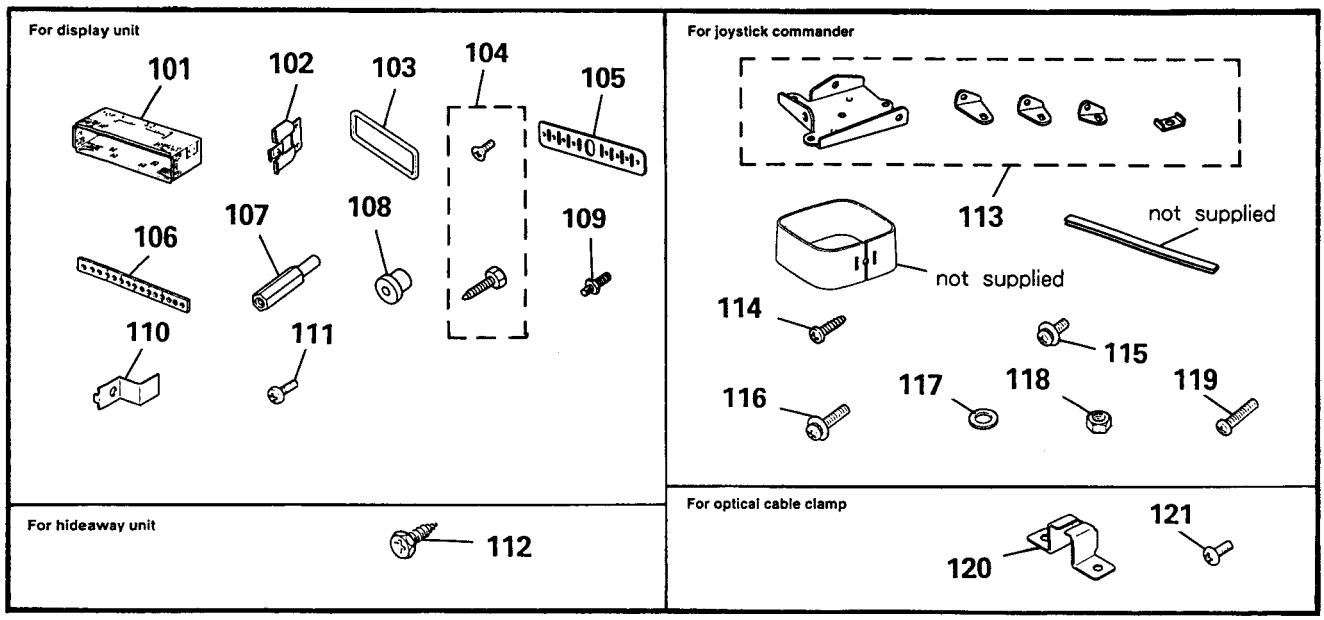
Ref. No.	Part No.	Description				Remarks
R529	1-260-028-11	CARBON MELF	470K	1%	1/8W	
R530	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R531	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R532	1-260-020-11	CARBON MELF	100K	1%	1/8W	
R533	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R534	1-216-254-00	CARBON MELF	220K	1%	1/8W	
R535	1-260-032-11	CARBON MELF	1M	1%	1/8W	
R536	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R537	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R538	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R539	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R540	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R541	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R542	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R543	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R544	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R545	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R546	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R547	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R548	1-259-985-11	CARBON MELF	150	1%	1/8W	
R549	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R550	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R551	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R552	1-259-995-11	CARBON MELF	1K	1%	1/8W	
R553	1-260-020-11	CARBON MELF	100K	1%	1/8W	
R554	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R555	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R556	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R557	1-260-004-11	CARBON MELF	4.7K	1%	1/8W	
R558	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R559	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R560	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R561	1-259-999-11	CARBON MELF	2.2K	1%	1/8W	
R562	1-259-983-11	CARBON MELF	100	1%	1/8W	
R563	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R564	1-260-008-11	CARBON MELF	10K	1%	1/8W	
R701	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R702	1-259-999-11	CARBON MELF	2.2K	1%	1/8W	
R705	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R706	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R707	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R708	1-260-016-11	CARBON MELF	47K	1%	1/8W	
R709	1-259-999-11	CARBON MELF	2.2K	1%	1/8W	
R710	1-259-999-11	CARBON MELF	2.2K	1%	1/8W	
R711	1-260-016-11	CARBON MELF	47K	1%	1/8W	

MAIN | POWER TERMINAL | RESET

Ref. No.	Part No.	Description	Remarks
R712	1-259-999-11	CARBON MELF 2.2K 1% 1/8W	
R713	1-260-016-11	CARBON MELF 47K 1% 1/8W	
R714	1-260-016-11	CARBON MELF 47K 1% 1/8W	
R715	1-260-016-11	CARBON MELF 47K 1% 1/8W	
R716	1-260-008-11	CARBON MELF 10K 1% 1/8W	
		< THERMISTOR >	
TH701	1-809-148-11	THERMISTOR, POSITIVE	
		< CRYSTAL >	
X501	1-567-820-11	VIBRATOR, CRYSTAL	
X502	1-577-305-11	VIBRATOR, CRYSTAL	
**********			
*	1-640-015-12	POWER TERMINAL BOARD	
		**********	
	1-537-347-11	TERMINAL BOARD	
		< CAPACITOR >	
C721	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
**********			
*	1-640-010-13	RESET BOARD	
		**********	
		< SWITCH >	
SW301	1-554-813-41	SWITCH, KEY BOARD (RESET)	
		< THERMISTOR >	
TH402	1-800-202-11	THERMISTOR S-10K	
		< VARIABLE RESISTOR >	
VR402	1-226-772-11	RES, ADJ, METAL 4.7K(VIEW)	
**********			
		MISCELLANEOUS	
		**********	
12	1-541-869-11	MOTOR (FAN)	
7	1-809-281-11	DISPLAY PANEL, LIQUID CRYSTAL	
F301	1-532-798-11	FUSE (BRADE TYPE) (AUTO FUSE) (1A)	
F401	1-532-797-11	FUSE (BRADE TYPE) (AUTO FUSE) (7.5A)	
**********			

Ref. No.	Part No.	Description	Remarks
		ACCESSORY & PACKING MATERIAL	
		**********	
	1-690-204-11	CORD, CONNECTION	
	1-532-798-11	FUSE (BRADE TYPE) (AUTO FUSE) (1A)	
	1-532-797-11	FUSE (BRADE TYPE) (AUTO FUSE) (7.5A)	
	2-201-810-00	MAGIC TAPE (A)	
	1-590-519-21	CORD (WITH CONNECTOR)	
	1-590-519-11	CORD (WITH CONNECTOR)	
	1-590-490-11	CORD (WITH CONNECTOR)	
	1-465-680-11	REMOTE COMMANDER (EZ) (JOYSTICK)	
	1-465-726-11	REMOTE COMMANDER (RM-X16) (MINI) (US, Canadian, E)	
	1-465-960-11	REMOTE COMMANDER (RM-X19) (AEP, French, Germany, Italian, UK)	
	1-465-969-11	REMOTE COMMANDER (AEP, French, Germany, Italian, UK)	
	X-3320-524-1	SCREW ASSY (A)	
	1-465-681-11	REMOTE COMMANDER (RM-X17) (FULL) (US, Canadian, E)	
	A-3234-826-A	REMOTE COMMANDE FITTING KIT (E)	
	1-543-827-11	CLAMP, SLEEVE FERRITE	
*	3-355-207-01	CARDBOARD (E)	
*	3-371-067-01	INDIVIDUAL CARTON	
*	3-371-076-01	CUSHION	
	3-336-617-01	BAG, PROTECTION	
*	3-371-069-01	CUSHION (JOINT)	
	3-753-164-11	MANUAL, INSTRUCTION (ENGLISH) (UK)	
	3-753-164-21	MANUAL, INSTRUCTION (ENGLISH) (US, Canadian, E)	
	3-753-164-31	MANUAL, INSTRUCTION (FRENCH) (French)	
	3-753-164-41	MANUAL, INSTRUCTION (GERMAN) (Germany)	
	3-753-164-51	MANUAL, INSTRUCTION (DUTCH) (AEP)	
	3-753-164-61	MANUAL, INSTRUCTION (ITALIAN) (Italian)	
	3-753-165-11	MANUAL, INSTRUCTION Joystick Commander operating instructions (ENGLISH) (UK)	
	3-753-165-21	MANUAL, INSTRUCTION Joystick Commander operating instructions (ENGLISH) (US, Canadian, E)	
	3-753-165-31	MANUAL, INSTRUCTION Joystick Commander operating instructions (FRENCH) (French)	
	3-753-165-41	MANUAL, INSTRUCTION Joystick Commander operating instructions (GERMAN) (Germany)	
	3-753-165-51	MANUAL, INSTRUCTION Joystick Commander operating instructions (DUTCH) (AEP)	
	3-753-165-61	MANUAL, INSTRUCTION Joystick Commander operating instructions (ITALIAN) (Italian)	
	3-753-166-21	MANUAL, FITTING (ENGLISH, FRENCH) (US, Canadian, E, UK, French)	
	3-753-166-41	MANUAL, FITTING (GERMAN, DUTCH, ITALIAN) (AEP, Germany, Italian)	

MOUNTING HARDWARE



Ref. No.	Part No.	Description	Remarks
		MOUNTING HARDWARE	
		**********	
101	3-323-219-01	FRAME, FITTING	
102	3-339-403-31	SPRING	
103	3-366-163-01	COLLAR	
104	X-3320-524-1	SCREW ASSY (A)	
105	3-323-217-01	HOLDER, BUSHING	
106	3-310-655-01	SUPPORT (ND), FITTING	
107	3-323-210-01	ADJUSTOR, STUD BOLT	
108	3-349-410-01	BUSHING	
109	3-323-209-01	BOLT (4-5), STUD	
110	3-372-795-01	BRACKET (RETAINER)	
111	7-682-547-04	SCREW +PTT 3X6 (S)	
112	3-367-410-01	SCREW (DIA. 5X15), TAPPING	
113	* X-3363-784-1	BRACKET ASSY (EZ)	
114	7-685-647-79	SCREW +BVTP 3X10 TYPE2 N-S	
115	7-682-947-01	SCREW +PSW 3X6	
116	7-682-649-09	SCREW +PSW 3X10	
117	7-688-003-11	W 3, MIDDLE	
118	7-684-023-04	N 3, TYPE 2	
119	7-685-648-79	SCREW +BVTP 3X12 TYPE2 N-S	
120	3-372-797-01	BRACKET (CONNECTOR)	
121	7-621-849-00	SCREW, TAPPING	

Ref. No.	Part No.	Description	Remarks
		HARDWARE LIST	
		**********	
#1	7-682-246-09	SCREW (+K3XT) (FE-NI)	
#3	7-682-547-04	SCREW +PTT 3X6 (S)	
#4	7-685-104-19	SCREW +P 2X6 155TYPE2 NON-SLIT	
#5	7-685-646-79	SCREW +BVW 3X8 TAPPING	
#6	7-682-548-04	SCREW +PTT 3X8157(S)	
#7	7-621-773-95	SCREW +PTT 2.6X6 (S)	
#8	7-628-254-50	SCREW (+PS) (2.6X16)	

9-956-421-12

Sony Corporation
Mobil Electronics Group

English
91L1681-1
Printed in Japan
©1991.12
Published by Customer Relations and Service Group